957 ECHNOLOGY DEPT

Gas Journal

VOL. 291. 109th YEAR. LONDON, JULY 24, 1957. Nº. 4906 PRICE 1/6

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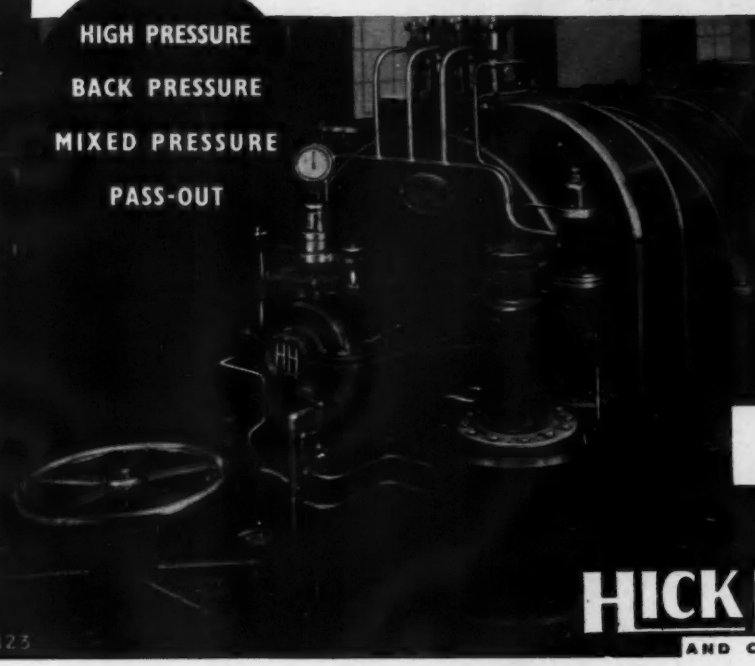

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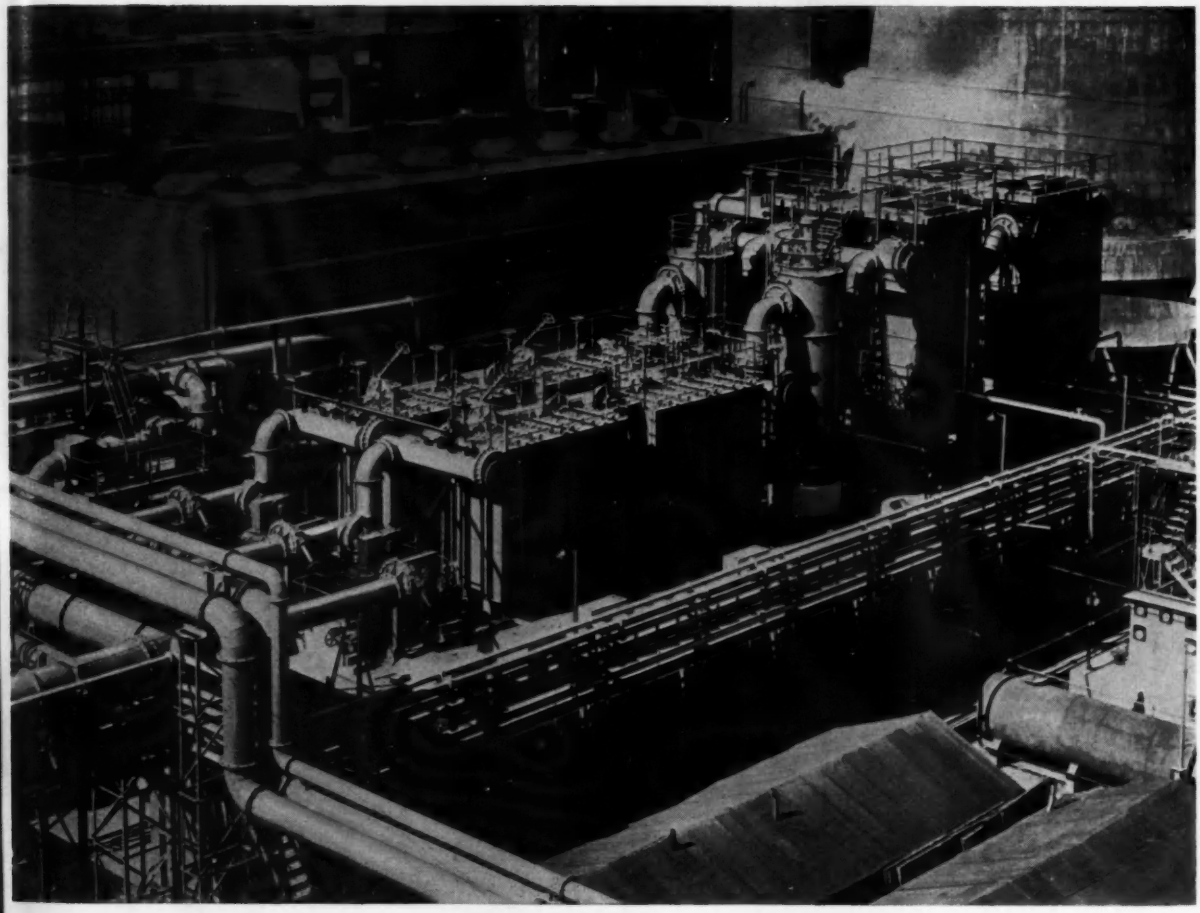

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Two complete treatment streams comprising condensers, W.W-D. electro-detarrers and multi-stage scrubbers, each stream capable of handling 4½ million cu. ft. of gas per day, were supplied to the order of Woodall-Duckham Construction Co. Ltd. for the Rotherham Works of the East Midlands Gas Board. A third similar stream is in the course of construction.

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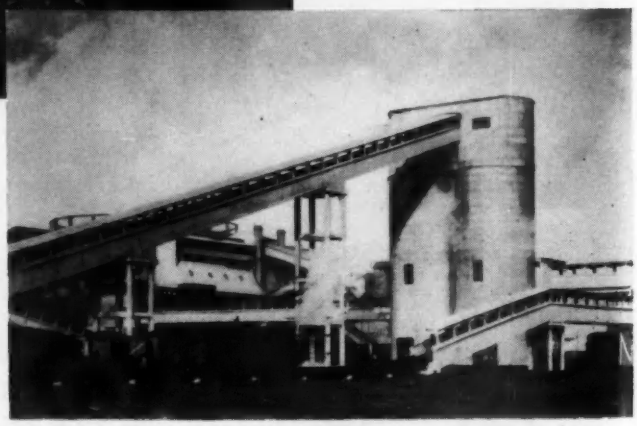

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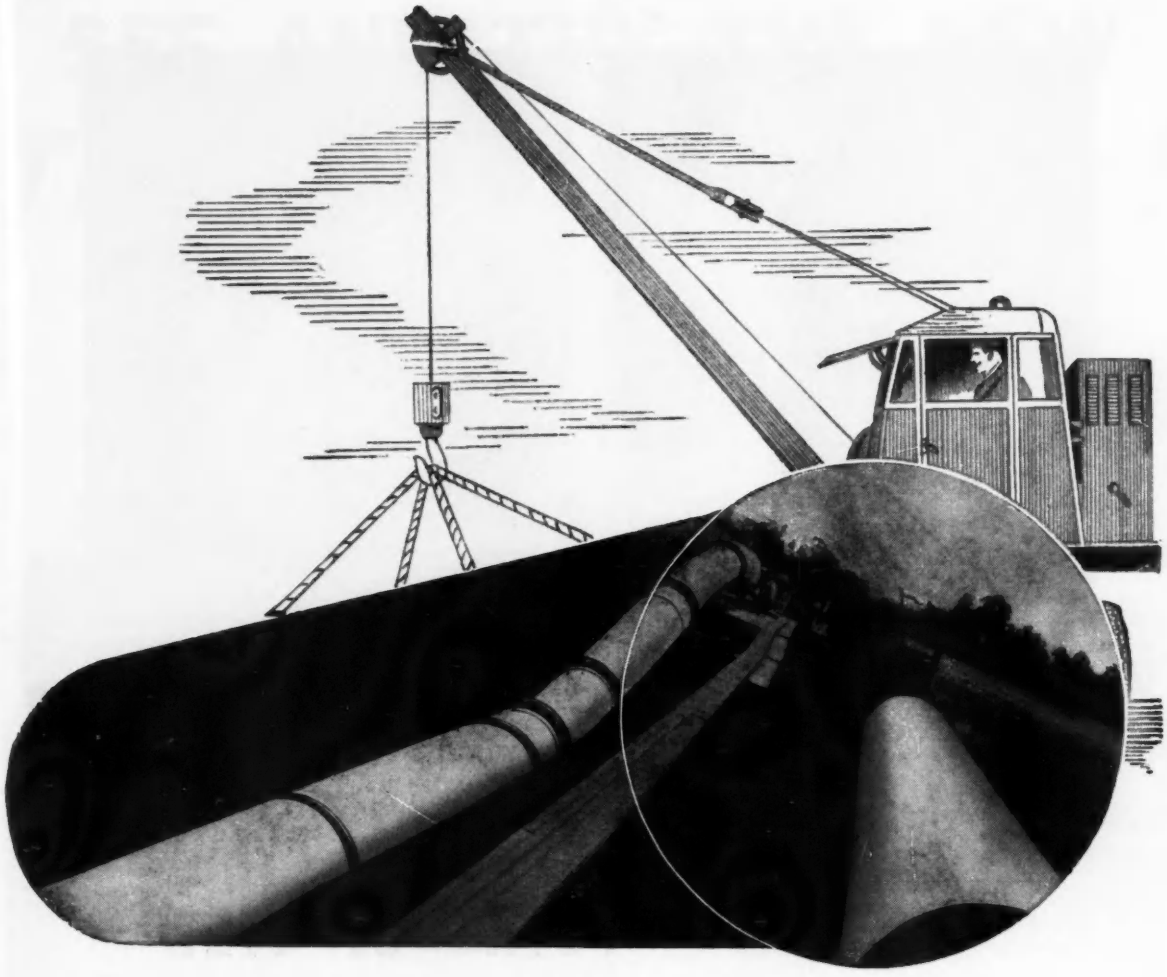

Pipe Line Progress...

The strength and comparative lightness of the large diameter steel pipe coupled with its sectional length of twenty-five feet means faster laying, fewer joints and no breakage risks—practical and economical progress. Other equally important features of these pipes are illustrated in our Catalogue S.P. 40.

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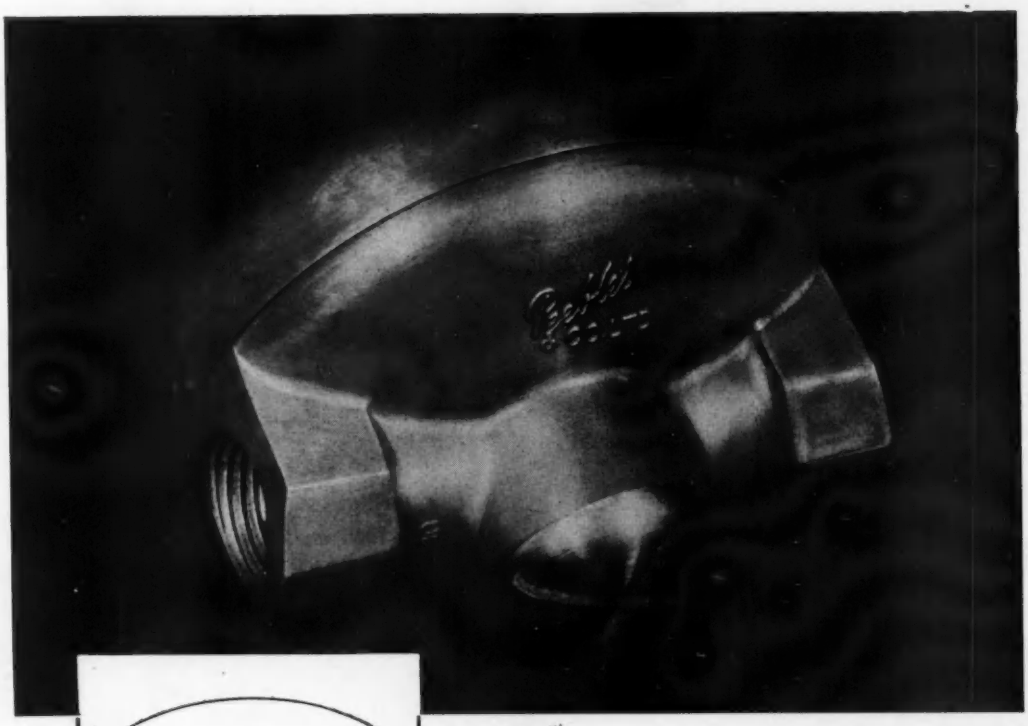

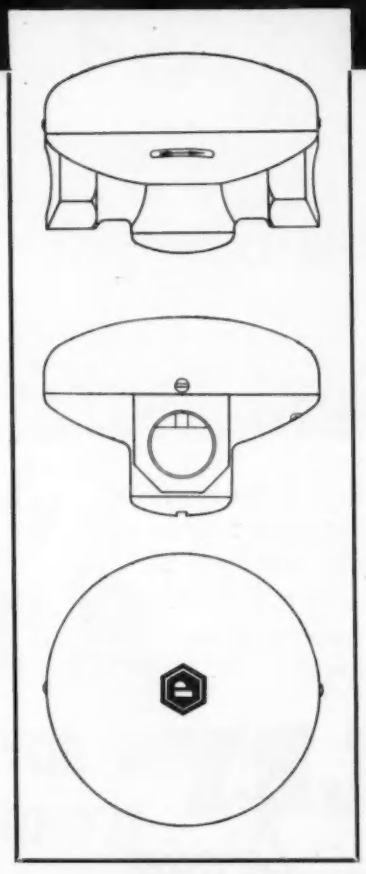

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The "Fig. 100" Appliance Governor is exceptional, not only in smooth exterior appearance, but also in its internal design, and its performance. Pressure die cast for close grained metal, designed and precision-made for stable performance and minimum maintenance costs, **it gives excellent response to every demand made upon it.**

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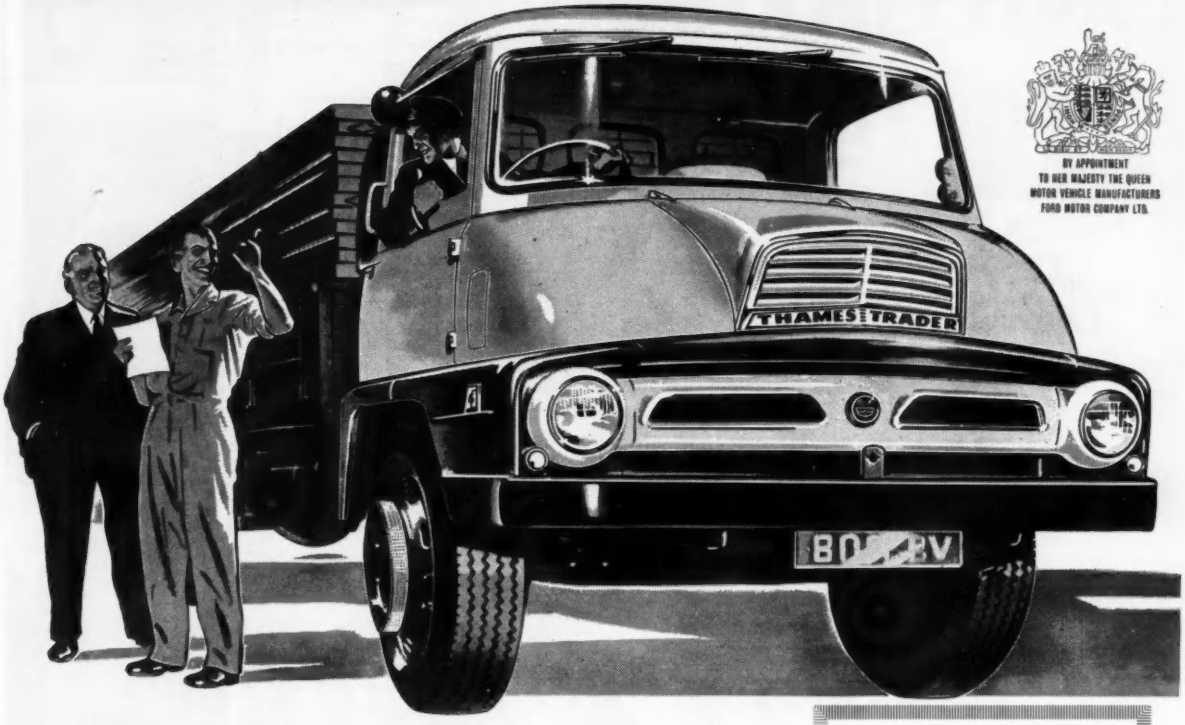

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30 CWT. 2-TONNER 3-TONNER 4-TONNER
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NEW THAMES '5-STAR' RANGE*

with 4 and 6 CYLINDER DIESEL AND PETROL ENGINES

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NEW 6-Cylinder Diesel Engine OR **NEW 6-Cylinder 100 B.H.P. Petrol Engine** — *for 4, 5 and 7 ton trucks 4½, 5 and 6 cu.yd. Tippers*

PLUS An extensive range of accessories and optional factory-fitted equipment . . .

and FORD SERVICE, too!

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the Speediest way is best!

MODERN BUILDING MATERIALS can be a veritable nightmare to the man who has to deal with the problem of making SPEEDY, PERMANENTLY SECURE FIXINGS having either LIGHT or HEAVY LOADING CAPACITY at an economic cost.

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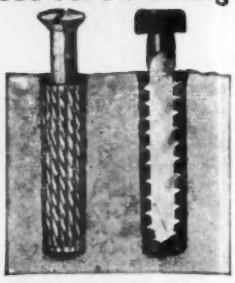

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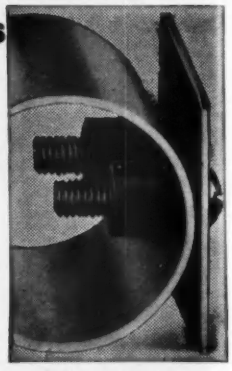
For almost impossible jobs use the Rawlnut. (You can even make a fixing to a pipe). The tapped nut in the end of the rubber bush is drawn up to the reverse face of the material by turning the screw. The result is an airtight, watertight, vibration-proof fixing of enormous strength. For thin plastic, metal, wallboard and hollow pot, etc., it is invaluable.



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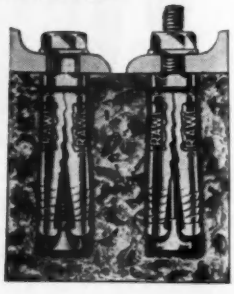

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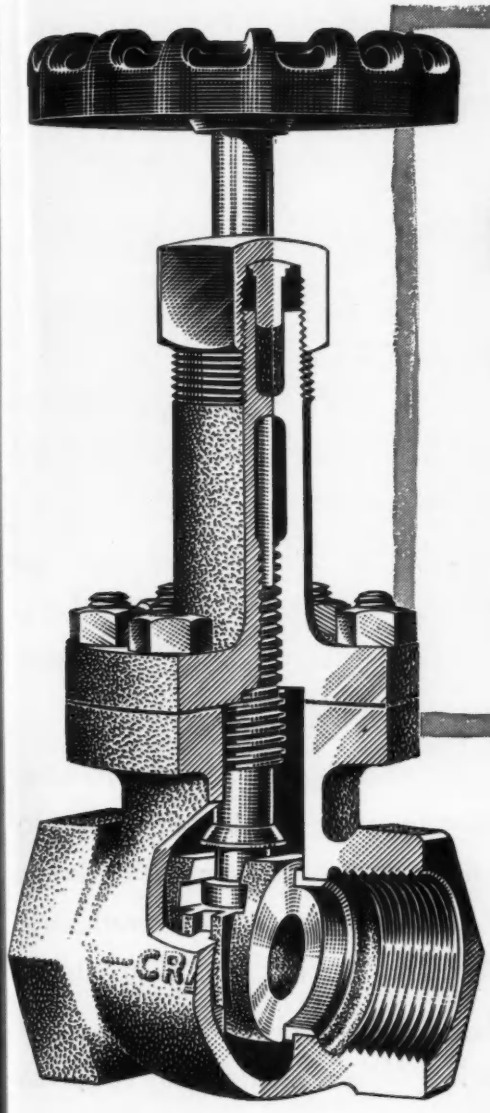

CRANE NICKEL ALLOY WEDGE DISC BRONZE GATE VALVES

with stainless steel seats

This recent addition to the Crane range is one of a new series of high pressure Bronze Valves—designed to take steam pressures up to 300 pounds (temperatures up to 550°F.) as well as water, oil or gas, cold, non-shock services up to 1000 pounds. To ensure an exceptionally rugged, durable valve, materials for all parts were carefully chosen. The body and bonnet are cast from high grade bronze, whilst the Nickel Alloy solid wedge disc and Stainless Steel seats are especially resistant to wear, being very hard and tough. Sizes 1 inch and smaller are supplied with a Union Bonnet; larger sizes have a compact inside screw bolted bonnet. Back-seating allows the valves to be repacked whilst fully open under pressure.

Another version of this valve, D185, having bronze integral seats but otherwise identical in all respects, is also available. Individual factory testing of these valves, as of all Crane products, ensures their complete dependability in service and low maintenance for the future.

D186 Sizes: ¼" to 2"

Hexagon ends with British Standard taper threads or to American Standards where specified.
Non-heat handwheel; Rising Stem.

Crane Bronze Check Valves D145 are recommended for use with these valves.

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VALVES OF BRONZE, CAST IRON AND CAST STEEL

V6

CRANE LTD., 15-16 RED LION COURT, FLEET STREET, LONDON, E.C.4 Works: IPSWICH. *Branches: Birmingham, Brentford, Bristol, Glasgow, London, Manchester*

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VIM Leather Packings form a vital part in the operation of hydraulic, pneumatic and other mechanisms.

Resistant to oils, acids, gases, sea-water and high temperatures, they are guaranteed to last at least twice as long as any other leather packing for similar service.

We have in Birmingham a Leather Packings Division including a well-equipped factory engaged in the production of the celebrated VIM Leather Packings. Precise methods of manufacture, high quality of materials and rigid inspection are maintained.

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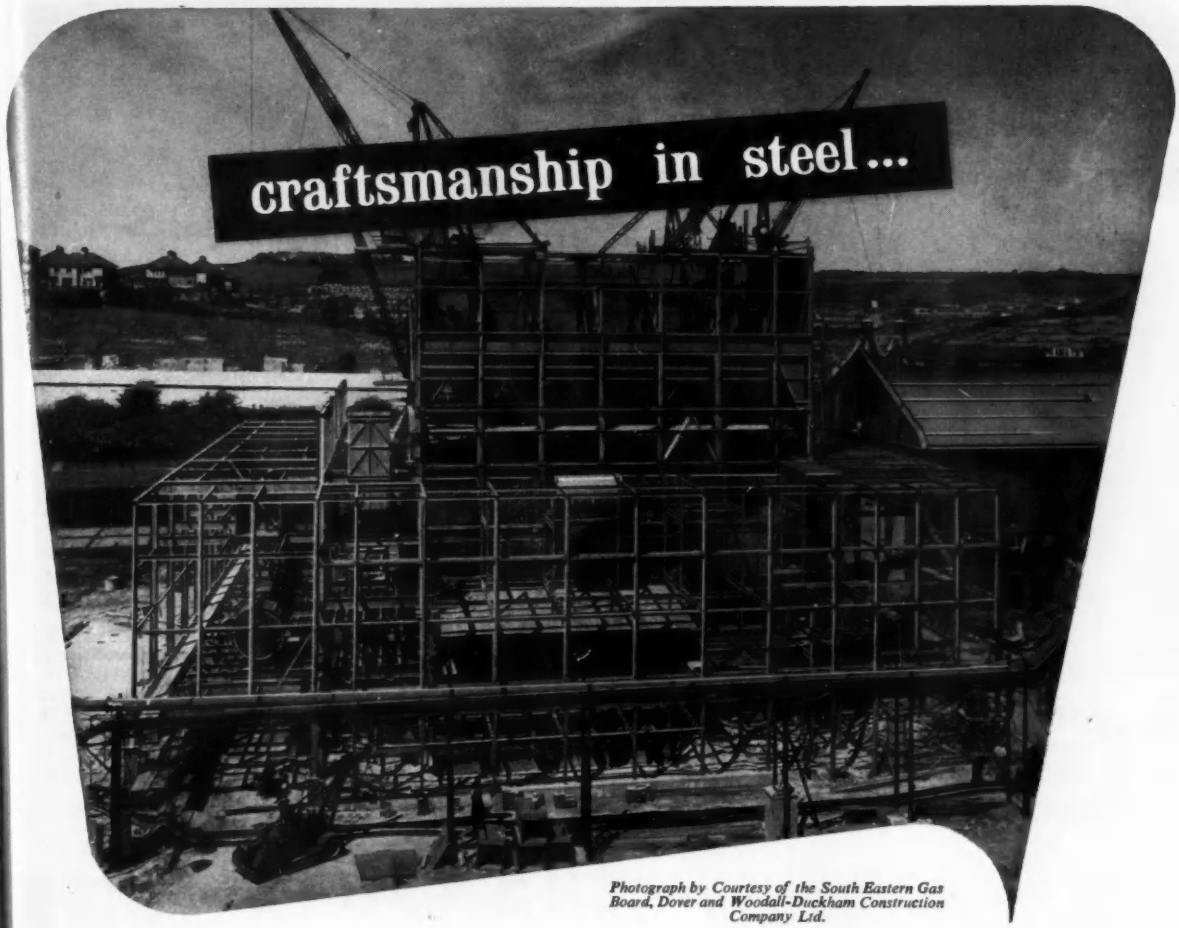

Photograph by Courtesy of the South Eastern Gas Board, Dover and Woodall-Duckham Construction Company Ltd.

Development at the Dover Works of the South Eastern Gas Board is yet another fine example of co-operation between experienced planners and engineers, and the resources of an organisation with exceptional works facilities. The supply of structural steelwork has been Walker Bros. contribution to the new Woodall-Duckham Installation of Continuous Vertical Retorts at Dover. These retorts are capable of carbonising 821 tons of coal per day, thereby producing some 13 million cubic feet of gas. We are highly organised to tackle any structural steelwork problem, from design to erection and ninety years of specialist knowledge and experience is at your disposal.

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Fowler Diesel Power at the South Durham Steel & Iron Co.

Also in use in 42 other major industrial undertakings in Great Britain

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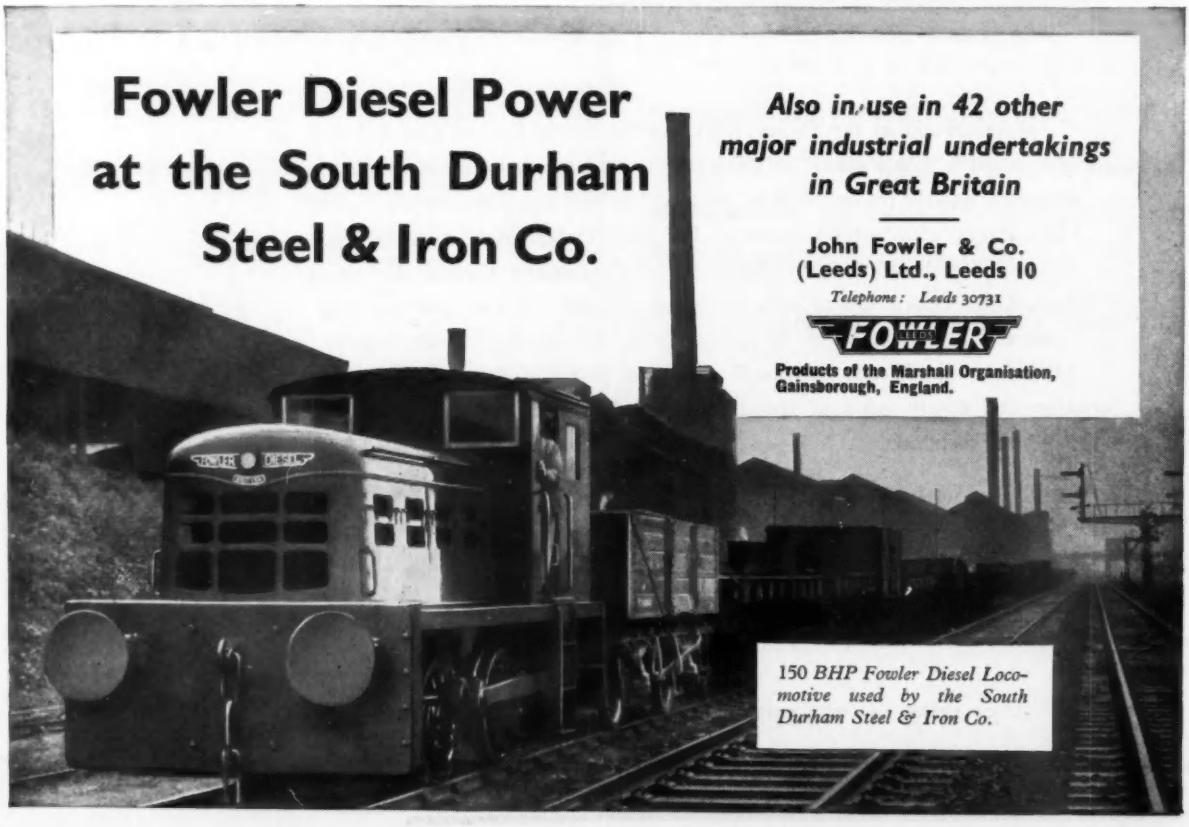
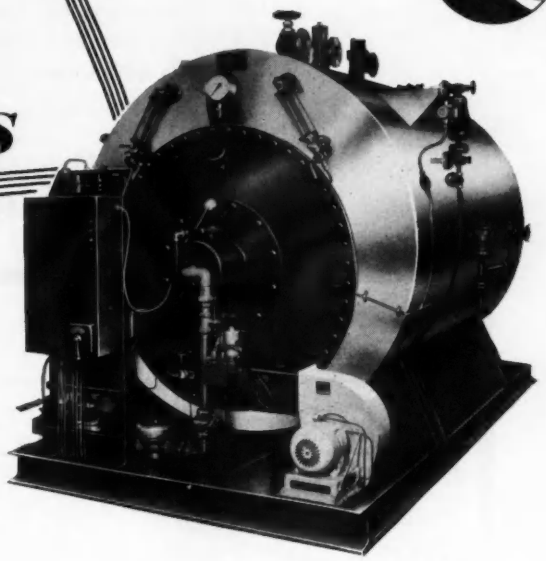
Products of the Marshall Organisation, Gainsborough, England.



150 BHP Fowler Diesel Locomotive used by the South Durham Steel & Iron Co.

SPANNER PACKAGED BOILERS

Swirlyflo Tubes



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FULLY AUTOMATIC

A packaged boiler is a complete steam producing unit, wherein the boiler, fuel burner, draught system and feed water tank are completely self-contained on one chassis.

Spanner Swirlyflo packaged boilers are available as vertical boilers as well as horizontal.
Vertical types are specially suitable for rapid steam raising and confined spaces. **250 lb. to 10,000 lb. of steam per hour.**

Horizontal types, as illustrated, are ideal for low head room spaces. **1,000 to 20,000 lb. of steam per hour.**

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STACKERS & BAGGERS

'BIG WALRUS' Fully Mobile STACKER

★ STACKS 120 TONS OF COAL PER HOUR!

This C & T Stacker is Electric or Diesel operated. When feeding from usual Tipping Lorries, ramps are unnecessary, as opening in extra wide hopper permits direct access from the front at low level. Rubber sealing flaps around hopper opening and steel skirt-plates on belt to reduce spillage to negligible proportions.

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Speed Handling · Reduce Costs!

★ CAN BAG AND WEIGH UP TO 12 TONS OF COAL IN 34 MINUTES!

This C & T Junior Bagging Unit designed to handle 1 cwt. Coal Bags, can cope with pieces up to 8" max. size. The unit incorporates Electrically Vibrated Bagging Chutes giving fine control over material being bagged—a footswitch leaving the operators' hand free to hold bag.

Full particulars of these equipments from :

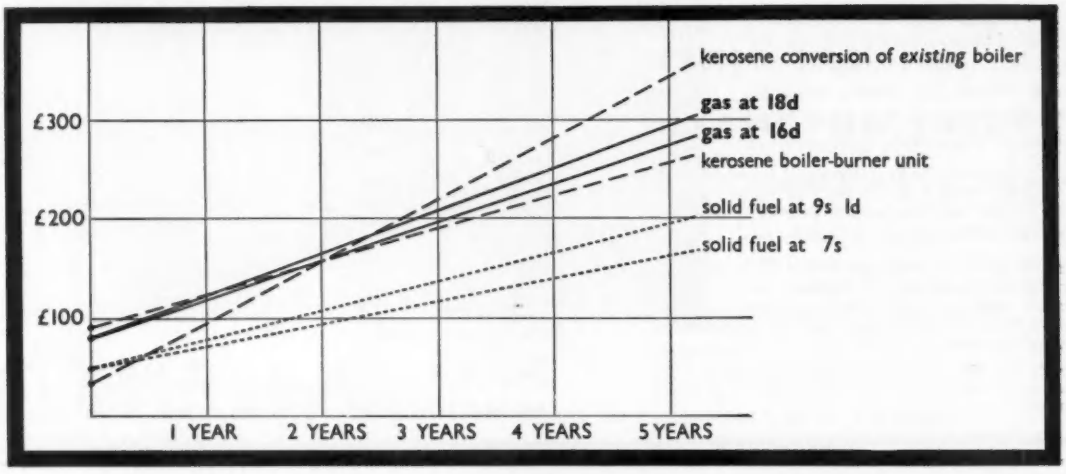
CRONE & TAYLOR (ENGINEERING) LTD.

SUTTON OAK, ST. HELENS, LANCS.
Phone : St. Helens 3283.

There is a big market for the small gas-fired boiler

More and more people, impatient with handling fuel and stoking and generally humouring boilers, are deciding that it is worth their while to spend a little extra in order to get absolutely automatic operation. How little extra they need to spend on a gas-fired boiler.

Costs of installing and running boilers of approximately 30,000 B.t.u/hr. output



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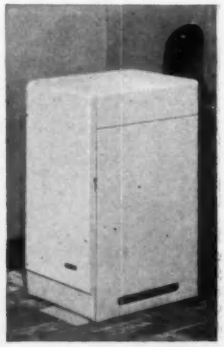
In calculating the initial outlay, the price taken for a gas-fired boiler is that of the 'Diplomat' 30; prices for other types of boiler are typical.

Installation costs are assumed typical figures, to the nearest £5.

Figures for running costs are based on annual usage at full output and full efficiency as follows: fully automatic 'Diplomat' 30, 1500 hours; semi-automatic Kerosene boiler or conversion, 1650 hours; non-automatic coke boiler, 1800 hours (i.e. each type of boiler providing equivalent service).

A 'Diplomat' 30 Gas-Fired Boiler will cost about £40 more than an equivalent solid fuel boiler, completely installed. Over five years, the running costs of solid fuel and gas may differ by about £70. There can be no doubt that many people would be happy to spend that amount—a matter of about 5/- a week—in order to say goodbye to all the fuss of looking after a solid fuel boiler. 'Diplomat' Gas-Fired Boilers, latest additions to the 'Potterton' range, achieve a thermal efficiency between 79% and 81%. They are certainly not expensive to run. They are proving an excellent proposition, especially in reasonably modern houses which have adequate insulation.



POTTERTON GAS FIRED BOILERS DE LA RUE

'Diplomat' boilers are now available with outputs of 30,000, 44,000, 66,000 and 100,000 B.t.u/hr.

Potterton Boilers make the most of gas, *automatically*

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INDEX TO 'JOURNAL' ADVERTISERS

PAGE

A

A.C.E. Machinery Ltd. ... ...
A.F.V. Company Ltd. ... ...
Abbott, Birks & Co. Ltd. ... ...
Acme Wringers Ltd. ... ...
Aerogen Co. Ltd. ... ...
Alder & Mackay Ltd. ... ...
Allan Taylor (Engineers) Ltd. ... ...
Aquafont Industries Ltd. ... ...
Ascot Gas Water Heaters Ltd. ... ...
Ashmore, Benson, Pease & Co. ... ...
Ashworth & Parker Ltd. ... ...
Aspinall's (Paints) Ltd. ... ...
Associated Lead Manufacturers Ltd. ... ...
Atlas Preservative Co. Ltd. ... ...
Audley Engineering Co. Ltd. ... ...
Automotive Products Ltd. ... ...
Averill, C. R., Ltd. ... ...

B

Bale & Church Ltd. 195
Balfour, Henry, & Co. Ltd. ... ...
Bells Asbestos & Engineering Co., Ltd. ...
Berry's Foundry (1949) Ltd. ... ...
Birtley Engineering Ltd. ... ...
Blakeley, Firth, Sons & Co. Ltd. ... ...
Bolton's Superheater & Pipe Work Ltd. ...
Borchardt, F.A., Ltd. ... ...
Bratt Colbran Ltd. ... ...
Bray, George, & Co. Ltd. ... ...
Bristol Pneumatic Tools Ltd. ... ...
British Carbo-Norit Union Ltd. ... ...
British Gas Purifying Materials Co. ... ...
British Jeffrey-Diamond Ltd. ... ...
British LaBour Pump Co. Ltd. ... ...
British Paints Ltd. ... ...
British Rototherm Co. Ltd. ... ...
British Thomson Houston Ltd. ... ...
British Tyre & Rubber Co. Ltd. 156
Broadbent, Thomas, & Sons Ltd. ... ...
Broom & Wade Ltd. ... ...
Brown, J., & Co. Ltd. ... ...
Bugden, Thos., & Co. ... ...

C

Cambridge Instrument Co. Ltd. ... ...
Cannon (G.A.) Ltd. ... ...
Cementation Co. Ltd. 164
Chemical Engineering Wiltons Ltd. ... ...
Cinema-Television Ltd. ... ...
Clapham Bros. Ltd. ... ...
Clayton, Son & Co. Ltd. ... ...
Cleckheaton Engineering Co. Ltd. ... ...
Clensol Ltd. ... ...
Clifford Engineering Co. Ltd. ... ...
Cochrane (Middlesbro') Foundry Ltd. ... ...
Cohen, George, Sons & Co. Ltd. ... ...
Concrete Proofing Co. Ltd. 169
Consett Iron Co. Ltd. ... ...
Cort, Robert, & Son Ltd. ... ...
County Chemical Co., Ltd. ... ...
Crane Ltd. 161
Crone & Taylor Ltd. 165
Crossley Bros. ... ...
Crosthwaite Furnaces & Scriven Mach. Tools Ltd.
Cutler, Samuel, & Sons Ltd. ... ...
Cuxson, Gerrard & Co. Ltd. ... ...

D

Davenport Engineering Co. Ltd. ... ...
Davey, Paxman & Co. Ltd. ... ...
Davies Bros. (Denton) Ltd. ... ...
De la Rue, Thomas, & Co. Ltd. (Gas Group) ... 166
Demolition & Construction Co. Ltd. ... ...
Dempster, R. & J., Ltd. ... ...
Dempster, Robert, & Sons Ltd. ... ...
Denison & Son Ltd. ... ...
Derbyshire Silica Firebrick Co. Ltd. ... ...
Diaphragm & General Leather Co. Ltd. ...
Donkin (The Bryan) Co. Ltd. ... ... Cover II
Douglas, Wm., & Sons Ltd. ... ...
Drakes Ltd. 168
Dresser Manufactures (England) Ltd. ... ...
Drew, H. B., Ltd. ... ...
Drummond Patents Ltd. ... ...

E

Eagre Construction Co. Ltd. ... ...
Edgar, Wm., & Son Ltd. ... ...
Econtrol Ltd. ... ...
Electric Construction Co. Ltd. ... ...
Electrofio Meters Co. Ltd. ... ... Cover IV
Electrolux Ltd. ... ...
Elliott Bros. (London) Ltd. ... ...
Esher Ltd. ... ...
Evered & Co. Ltd. ... ...
Ewart & Son Ltd. ... ...
Ewart Chainbelt Co. Ltd. ... ...

F

Fibreglass Ltd. ... ...
Fisher & Ludlow Ltd. ... ...
Flavel, S., & Co. Ltd. ... ...
Fluidrive Engineering Co. Ltd. ... ...
Ford Motor Co. Ltd. 159
Fowler, John, & Co. (Leeds) Ltd. 164

G

Gas Purification Ltd. 195
General Electric Co. Ltd. ... ...
Gibbons Bros. Ltd. ... ...
Girdex Engineering Co. Ltd. ... ...
Glover, George, & Co. Ltd. ... ...
Glover, Thomas, & Co. Ltd. ... ...
Godfrey, Sir George, & Partners (Industrial) ... 194
Goodall Clayton & Co. Ltd. ... ...
Goodyear Industrial Rubber Products Ltd. ...
Grant Lyon & Co. Ltd. ... ...
Graphite Products Ltd. ... ...
Greenwood & Batley ... ...
Green & Boulding Ltd. ... ...
Gunite Construction Co. Ltd. ... ...

H

Hamilton, A. H., & Co. Ltd. ... ...
Hardman & Holden Ltd. ... ...
Harris & Pearson Ltd. 198
Harris Engineering Co. Ltd. ... ...
Harrisons (London) Ltd. ... ...
Harvey, G. A., & Co. (London) Ltd. ... ...
Hick Hargreaves & Co. Ltd. ... ... Cover II
Hilmor Ltd. ... ...
Holman, Michell & Co. Ltd. ... ...
Holmes, W. C., & Co. Ltd. 197
Hopkinsons Ltd. ... ...
Horseley Bridge & Thomas Piggott Ltd. ... 157
Horstmann Gear Co. Ltd. ... ...
Hudswell Clarke & Co. Ltd. ... ...
Hughes, F. A., & Co. Ltd. 183
Humphreys & Glasgow Ltd. ... ... Cover I

I

I.C.I. Ltd. (Metals Division) ... ...
Ideal Boilers & Radiators Ltd. ... ...
Inertol Ltd. ... ...
Ingham, John, & Sons Ltd. ... ...

J

Jeavons, E. E., & Co. Ltd. ... ...
Jeavons Engineering Co. ... ...
Jenkins, W. J., & Co. Ltd. ... ...
Johnson, C. H., (Machinery) Ltd. ... ...
Joy-Sullivan Ltd. ... ...

K

Keay, E. C. & J., Ltd. ... ...
Keelavite Rotary Pumps & Motors Ltd. ...
Keir, J. L. & Co. Ltd. ... ...
Kings Patent Agency Ltd. 195
King, Walter, Ltd. 195, 196
Kirkham, Hulett & Chandler Ltd. ... ...

L

Lafarge Aluminous Cement Co. Ltd. ... ...
Lamont, James H., & Co. Ltd. ... ...
Le Bas Tube Co. Ltd. ... ...
Lee, Howl & Co. Ltd. ... ...
Lincoln Electric Co. Ltd. ... ...
Lind, Peter, Ltd. ... ...
Lionweld Ltd. ... ...
Lythgoe, Adam, Ltd. ... ...

M

MacLellan, George, & Co. Ltd. ... ...
Macpherson, Donald, & Co. Ltd. ... ...
Magnetic Valve Co. Ltd. ... .
Main, R. & A., Ltd 188, 189
Major Robinson & Co. Ltd. ... .
McNeill, F., & Co. Ltd. ... ...
Meltham Silica Fire Brick Co. Ltd. ... ...
Metal & Pipeline Endurance Ltd. ... ...
Meters Ltd. ... ...
Metropolitan-Vickers Electrical Co. Ltd. ...
Midland Iron & Hardware Co. (Cradley Heath) Ltd. 195, 198
Milne (Edinburgh) Ltd. 198
Mint, Birmingham Ltd. ... ...
Mitchell Engineering Ltd. ... ...
Mitchell, H., & Co. ... ...
Moler Products Ltd. ... ...
Monk, A., & Co. Ltd. ... ...

N

National Benzole Co. ... ...
Neville, J. C., Ltd. ... ...
New Conveyor Co. Ltd. ... ...
Newton Chambers & Co. Ltd. ... ...
Norwest Construction Co. Ltd. ... ...

O

Oxley Engineering Co. Ltd ... ...

P

Parkinson & Cowan (Gas Meters) Ltd. 170
Parkinson Stove Co. Ltd. 192, 193
Pass, E., & Co. Ltd. ... ...
Peebles & Co. Ltd. 158
Perl Controls Ltd. ... ...
Plenty & Son Ltd. ... ...
Power-Gas Corporation Ltd. ... ...
Press, William, & Son Ltd. ... ...
Pyrene Co., Ltd. ... ...

R

Radiant Heating Ltd. ... ...
Radiation Ltd. 184, 185
Rawlplug Co. Ltd. 160
Reavell & Co. Ltd. 198
Ride & Bell Ltd. ... ...
Roberts, R. E., & Sons Ltd. ... ...
Robinson, J. H., & Co. (Liverpool) Ltd. ...
Royston, Geo., & Sons Ltd. ... ...
Rozalex Ltd. ... ...

S

Salter, T. E., Ltd. ... ...
Saunders Valve Co. Ltd. ... ...
Sawyer, Geo. E., Ltd ... ...
Scientific & Projections Ltd. ... ...
Senior Economisers Ltd. ... ...
Shaw Petrie Ltd. ... ...
Shell Chemical Co. Ltd. ... ...
Siebe Gorman & Co. Ltd. ... ...
Siemens-Schuckert (Great Britain) Ltd. ...
Sigma Instrument Co. Ltd. ... ...
Simon, Richard, & Sons Ltd. ... ...
Smith & Nephew Ltd. ... ...
Smith Meters Ltd. ... ...
Smith, Thos., & Sons (Rodley) Ltd., ...
Spanner Boilers Ltd. 165
Spencer-Bonecourt Clarkson Ltd. ... ...
Speedwell Gear Co. ... ...
Sperryn & Co. Ltd. ... ...
Stanton Ironworks Co. Ltd. ... ...
Staveley Iron & Chemical Co. Ltd. ... ...
Stein, John G., & Co. Ltd. ... ...
Stewart & Gray Ltd. ... ...
Stewarts & Lloyds Ltd. ... ...
Stillite Products Ltd. ... ...
Stoves Ltd. ... ...
Strachan & Henshaw Ltd. ... ...
Stringer Bros. ... ...
Sugg, Wm., & Co. Ltd. ... ...
Sutcliffe Speakman & Co. Ltd. ... ...
Sutherland, A. G., Ltd. ... ...

T

T & T Works Ltd. ... ...
Tangyes Ltd. ... ...
Teddington Refrigeration Controls Ltd. ...
Thorp, Thomas, & Co. Ltd. ... ...
Tully Engineering Co. Ltd. ... ...
Turners Asbestos Cement Co. Ltd. ... ...

U

Underpressure Engineering Co. Ltd. ... ...
United Gas Industries Ltd. ... ...Facing p. 179
United Kingdom Construction and Engineering Co. Ltd.

V

Vaughan, Edgar, & Co. Ltd. 162
Vauxhall Motors Ltd. ... ...
Visco Engineering Co. Ltd. ... ...

W

Wakelin, F. H., Ltd. ... ...
Walker Bros. Ltd. 163
Walker, C. & W., Ltd. ... ...
Walkers (Century Oils) Ltd. ... ...
Walkers and County Cars Ltd. ... ...
Waller, George, & Sons Ltd. ... ...
Walter King Ltd. 195, 196
Ward, Thos. W., Ltd. ... ...
Weir, G. & J., Ltd. ... ...
Wellington Tube Works Ltd. ... ...
West's Gas Improvement Co. Ltd. ... Cover III
West's Piling & Construction Co. ... ...
Westwood & Wrights Ltd. ... ...
Whessoe Ltd. 155
Whitley Moran & Co. Ltd. 198
Whitlock Bros. Ltd. ... ...
Wilkes, A. H., & Co. Ltd. ... ...
Williamson, Cliff, Ltd. ... ...
Wilson, George, Gas Meters Ltd. ... ...
Winn & Coales Ltd. ... ...
Woodall-Duckham Construction Co. Ltd. Facing p. 178
Wood, Hugh, & Co. Ltd. ... ...

Y

Yorkshire Copper Works Ltd. ... ...

Z

Zinc Development Association ... ...

Agencies ... ...
Appointments Vacant 195, 196
Appointments Wanted ... ...
Books ... ...
Contracts Open ... ...
Educational ... ...
Fellowship ... ...
Miscellaneous ... ...
Patents 196
Plant &c. For Sale 195
Plant Wanted. ... ...
Publications ... ...
Public Notice ... ...

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Coke Screening Plant showing twin skip hoist, De-breezers and Bagging Platform. Total capacity of Hoppers 500 tons.

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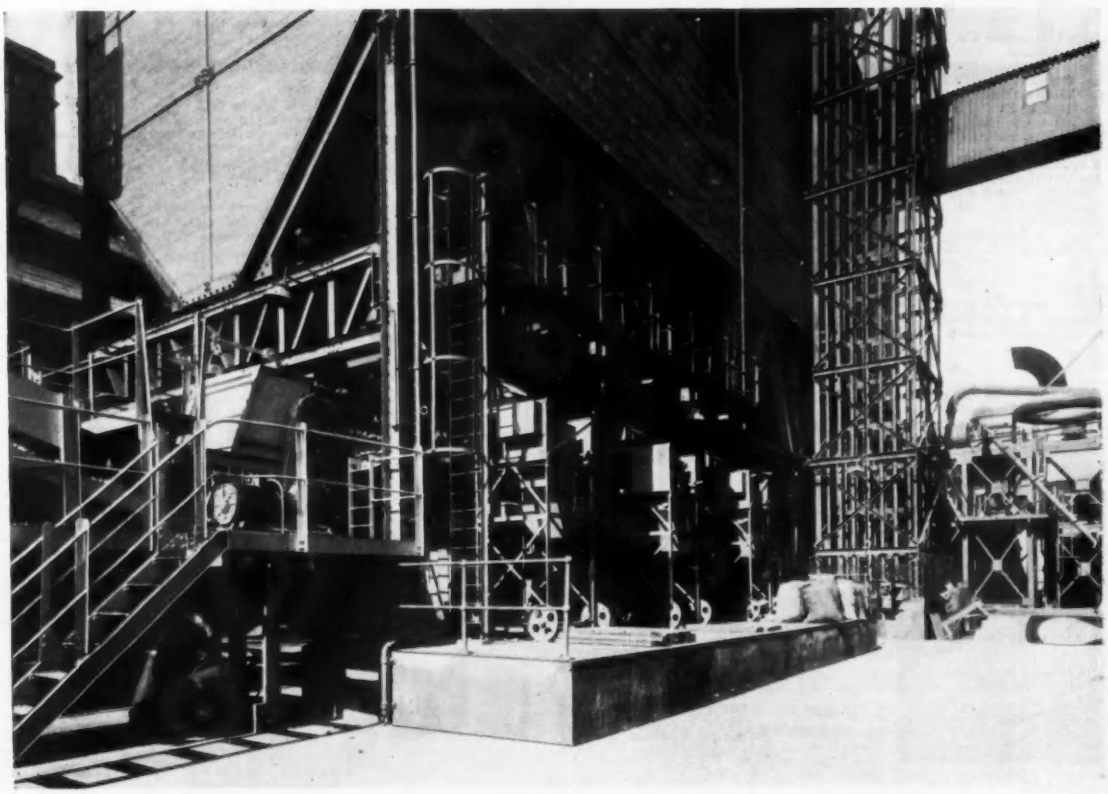

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Gas Journal

VOL. 291 *NO. 4906* *July 24, 1957*

109TH YEAR

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EDITOR: Geoffrey W. Battison

TECHNICAL EDITOR: Charles J. P. de Winton, T.D., M.A., M.Inst. Gas E., M. Inst. F.

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CONTENTS

Page

EDITORIAL COMMENT

Gas and the Inflationary Spiral .. 171
Continuing Need for Coal .. 172
The Rise of Sui Gas .. 173

CORRESPONDENCE

The New Zealand Controversy, Rupert Worley .. 173

NEWS OF CURRENT EVENTS

Personal .. 174
Diary .. 174
Calendar and Directory Alterations .. 174
Scottish Gas Board Introduces New Tariff .. 175
More Gas Price Increases are Announced .. 175
Mr. Therm Makes a Splash .. 175
Refinery Gas Begins to Flow .. 175
Association Technique de l'Industrie du Gaz en France Holds Annual Conference .. 176
South Eastern Gas Board Launches New Tanker .. 178
Manchester Juniors Meet at Partington for Ladies' Day .. 179
N.T.G.B. Awards 35 Medals for Gallantry .. 179
Irish Mail Boat Inspected .. 179
Whessoe Ltd., Orders Continue at High Level, Chairman Reports .. 180
Simon-Carves Ltd., Have Large Export Orders on Hand .. 180
Fall in Demand Was Beyond Our Control, says Meters, Ltd., Chief .. 180
600 Group Ltd. .. 180
Coalite Net Profits Rise .. 180

TECHNICAL RECORD

The Manufacture of Town Gas from Liquid or Gaseous Fuels. By E. J. Lawton .. 181
Corrosion and the Advantages of Zinc Protective Anodes .. 191

PUBLISHERS' NOTICE, SEE PAGE 195

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Gas Journal

VOLUME 291. No. 4906. JULY 24, 1957. 109th YEAR

Gas and the Inflationary Spiral

IT is a long while since the country has been so cost-conscious and seething with indignation at the continuing upward thrust of the price spiral. As usual it was coal which set the pace. The total extra charge to industry brought about by the increased coal prices has been estimated at £29 mill., including the direct effect on costs of electricity, gas and coke supplied to industry. To offset this extra charge it would be necessary to reduce industrial consumption of fuel, including oil, by 5 or 6%—a rather forlorn hope! Few things can be more depressing or irritating to the nation than the fact that despite increased mechanisation and investment the National Coal Board produced no more coal in 1956 than in 1951, and coal prices have climbed with monotonous regularity. The week before last, with the industry in the midst of its statutory holiday period, production fell by 15,000 tons; voluntary absenteeism is half as high again as last year. Fortunately, owing to warmer weather and holidays in industry, consumption has also fallen and stocks are well over 25 mill. tons.

One of the principal results of the Coal Board's inability to hold prices is an unfair burden on the gas industry which, being largely dependent on coal for making its products, is one of the first to reflect price increases. The effect of the last price jump has already been shown by the Northern, Scottish, South Western and South Eastern Boards which have announced a rise in the price of gas, and they will almost certainly be followed by other boards. Inevitably at such a time of indignation and depression the nationalised industries are high on the list of convenient scapegoats and there has been a considerable volume of argument in which both sides have overstepped the party line. It is a comical position in that the Opposition, although anxious to blame the Government, feel bound to defend their nationalised brainchildren, while the Government, although in general opposed to nationalisation, are compelled to stick up for the nationalised industries which they have had perforce to adopt and which it is their responsibility to manage. While Mr. Gerald Nabarro (Con., Kidderminster) maintained that ' Mr. Macmillan's plateau is being blown to pieces by the endless extravagance of the State boards, headed by the Coal Board with their cost-plus mentality and lack of business acumen,' Mr. W. Blyton (Lab., Houghton-le-Spring) said that while nationalised industries stabilised their prices in 1956 and 1957, private enterprise increased theirs, and asked ' Is it not about time the Government gave the nationalised bodies a square deal instead of blaming them for the faults of private enterprise?'

Meanwhile the newspapers have been getting themselves into a prize muddle. For example, while the *Daily Express*, publishing a chart showing ' how the Prime Minister's price plateau is being blasted ' revealed one of the blasting agents as electricity which had gone up 5 or 6%, its Beaverbrook brother the *Evening Standard* claimed that of the State-owned industries only electricity had done something to stop its prices from racing ahead! The *Daily Sketch*, in a front-page report about Tory M.P.s' moves to demand an end to rising prices in the State-run industries included pictures of heads of nationalised industries ' on the spot,' including Sir Harold Smith who ' gets £6,000 plus for bossing gas.'

It would be foolish to under-estimate the influence of this sort of thing on public opinion which, as usual, is based on an incomplete knowlege of the facts. Thus while it is probably fair to say that in general the public welcomes the back-bench agitation for a full-scale enquiry into State board management, and even legislation to take control of finance out of the hands of the boards, it is unlikely that during the witch hunt much attention will be paid to these industries' solid achievements since nationalisation. For example, as a result of increased efficiency of fuel utilisation since vesting date the gas industry has saved nearly 10 mill. tons of

coal, worth £40 mill., and the electricity industry about 35 mill. tons, worth some £120 mill. In view of such facts we must regard the suggestions made concerning a curtailment of the programmes of the nationalised industries with misgivings. These industries supply the very life-blood of the country and to starve them of capital investment would in the long run slow down our progress and seriously handicap our economy; in fact nothing would be more likely to bring about a continuation of our present difficulties.

The *Financial Times* made this comment on the situation: 'It is not surprising . . . that the Government is toying with the idea of postponing certain of the investment plans of the nationalised industries. Total capital expenditure seems still to be slowly rising and will tend to rise further as production gets into its stride again. The credit squeeze will help to ensure that the plans of private industry are tailored to the savings available to finance them, but the plans of the nationalised industries are drawn up on a basis which has little relation either to the level of their profits or to the state of the capital market. Moreover, they are on so large a scale—the approved expenditure of the fuel industries for 1957 amounts to £440 mill. and the railways expect to spend £120 mill.; the total for manufacturing industry last year was only £859 mill.—that it is natural for the Government to regard them as a major element in the balance of the economy and to adjust them as the situation demands. The present state of the gilt-edged market, which makes it necessary to cover Exchequer advances to the nationalised industries with bill finance, further strengthens the case for bringing the capital plans of these industries down rather nearer to a level they could support from their own funds . . .'

Fortunately it would appear that Lord Mills is opposed to any such curtailment. So confusing, contradictory and downright silly are the statements being made that it is difficult to face the future without flinching. We read that the Labour Party has announced its intention of controlling industries by the acquisition of shares; that a member of the North Eastern Gas Consultative Council has said that it is up to industry to employ a reasonable proportion of staff who were 'not really first-class'; and that Mr. Nigel Birch, the Economic Secretary to the Treasury has told the House 'We have an admirable economic and financial policy.' Really, it is difficult to know whether to laugh or cry!

Continuing Need for Coal

THE report of the Industrial Coal Consumers' Council for the year ended June 30, 1957, shows quite clearly the important position that coal is likely to occupy in the meeting of energy requirements as far ahead as members of the Council can foresee. In spite of the appearance of atomic energy and the greatly expanded programme for the building of electric power stations 'fired' by atomic energy, there appears to be no question of this resulting in a fall in demand for coal by industry. The Council points out that this would fully justify the expenditure by the N.C.B. of large sums of money on the bringing up to date of obsolescent collieries, the general mechanisation of all collieries, and the sinking of new pits. There would, therefore, be no reason for thinking that those employed in the coal industry need have any fear for their future security; in fact, the report goes on to say that those who work in the industry have an assurance of future stability as great as any worker. This expression of opinion could hardly be clearer.

Since the war industry has been supplied with all the coal it has needed to keep it going, except for the first winter of nationalisation when the shortage of coal had a severe effect during the very cold weather of February, 1947. This has not happened since but the coal industry has had to show considerable foresight and ingenuity in making quite certain that it did not. The export of coal on anything like the pre-war scale has had to be severely curtailed and coal has even had to be imported. The Government's decision to raise oil imports has had its effect. Coal has in fact been made to go round. The gas industry, which was nationalised three years after the coal mining industry, has been able to contribute to large savings in coal consumption by rationalising its means of production and, as in other industries, by the use of oil. The price paid for this security in coal supplies has been a loss in foreign exchange earnings and a substantial drain on our dollar reserves from the importing of coal from the United States.

To make quite certain that the collieries should both operate at a constant rate throughout the year and be able to raise as much coal as possible, it has been necessary for industry to stock larger quantities of coal than was necessary in the past. This has meant that very large stocks have had to be carried throughout the greater part of the year to be on the spot for consumption during the first three months of the year. This has led to complaints of the deterioration in coal quality during stocking, and the necessity of constantly turning over stocks with the consequent heavy costs in double handling and the short duration of coal actually in stock. The report is of the opinion that such complaints are not justified and that any trouble that may arise from the physical degradation of coal in stock is due to bad stocking. Modern methods would avoid these troubles.

During the period under review there has been no increase in the price of coal but the report points out that the Council were consulted by the N.C.B. about an increase in price which would take place from July 1. The Council were disappointed that any such request should have to be made, especially when the N.C.B. had made a surplus of £31.8 mill. in 1956. Though coal prices in Great Britain may be lower than anywhere else in Europe, any rise in the price of coal is liable to have very distinct inflationary effects on the country's economy, and therefore the consumer members of the Council were strongly opposed to such an increase. However, the N.C.B. pointed out that there was a great need for increased revenue and the Council saw no practical alternative but to agree.

Other fuels that come under notice of the Council include coke, both metallurgical and gas coke. Stocks of coke, both at coke ovens and at gasworks, have been very high throughout the winter, although exports have also been high. The report refers to a request made to the Gas Council to do all it can to limit the amount of moisture in coke supplied to industry and suggests that it would be of interest to know whether any area

board had considered declaring moisture standards which would not be exceeded. By this means, although it might be impossible to sell coke at a definite moisture content, industrial buyers would at least know that all coke bought would be within the maximum allowed. Such an undertaking would be a difficult one to carry out although the Gas Council may have thought that it would be highly desirable to do so. The stocking of large quantities of coke at the gasworks in all weathers makes it impossible to prevent it taking up considerable quantities of moisture. Added to this there are always difficulties over the practical means of coke sampling which would be necessary if such a guarantee were given. This would mean that each consignment, if in bulk, might have to be sampled jointly by the consignee and the buyer before it left the gasworks, or continuous sampling of coke stocks would have to be carried out, which would then have to be sold before bad weather made the coke unsaleable.

The Rise of Sui Gas

WHILE the introduction of natural gas in Pakistan is resulting in much the same boom conditions as have followed its discovery elsewhere, there are certain factors which render the situation different from that obtaining in other countries. Whereas in America, for example, natural gas revolutionised domestic heating, in Pakistan, where only a small quantity of indigenous fuel is available, this fuel is at present being reserved for industry. There are already over a hundred industrial and commercial consumers, representative of all major industries, and in 22 months consumption has multiplied nearly 40 times. According to *Progress*, a Pakistani Government publication, the growth of natural gas in districts between Sui and Karachi is such that more is being sold than the total amount of furnace oil consumed by industries in the whole of West Pakistan.

A comparison of prices explains the new fuel's supremacy. On an average the cost of gas is approximately 5% less than the cost of furnace oil on present prices based on the gross calorific values of both fuels, but operating efficiency of gas may be as much as 40% more than oil in certain heat treatment processes. Negotiations are in progress to reduce the price of gas and when the new prices are introduced, the total saving should be at least 10%. If and when furnace oil prices rise, and that is the tendency these days, Sui gas will be even more competitive.

Even though transportation charges, customs duty, insurance, etc., on pipes and other equipment raises the cost of the gas by 34% in Pakistan as compared with the U.S.A., it seems certain that the future for Sui gas is singularly bright.

CORRESPONDENCE

The New Zealand Controversy

DEAR SIR,

In your issue of May 15 you quote from *Live Lines* the official journal of the New Zealand Electric Power Authorities' Association, which gives the statistics of the New Zealand gas industry as published by the Government. Presumably this is the only reply which the electric supply authorities have to the article written by me and published in your columns of March 13. These facts are not disputed. The New Zealand gas industry has lost some ground in recent years. The only reason for this loss, as stated in my former article, is the unfair trading practices of the electric forces in New Zealand. In the same issue, May 15, you publish the outstanding Presidential address of Sir Henry Jones. May I quote from Sir Henry's address.

'Nor do I know of any parallel among area gas boards to the practice of one area electricity board of selling electricity to domestic consumers at an average rate lower than that charged to industrial and commercial customers. I hope that the disadvantages of the undue stimulation of domestic demand for electricity will become manifest, perhaps even to the electrical industry. Gas will then meet electricity on a fairer basis than now in that part of the domestic heating market for which it is so well fitted.'

The one and only reason for the decline in the overall figures for the New Zealand gas industry is that in New Zealand *every* electrical power authority —not one as in England—has always sold electricity to the domestic consumer at an average price well below the average for the industrial and commercial consumer. In support of this I quote from the 'Annual Statistics in relation to Hydro-Electric Development and Operation,' 1956, published by the New Zealand Government:

Revenue from sale of electricity	Per unit sold	Per unit sold (domestic)
Average of all electric power boards	1.162d.	1.026d.
Auckland Electric Power Board	1.033d.	0.890d.
Average of all other city electric authorities	1.012d.	0.753d.
Average of all borough electric authorities	1.355d.	1.001d.

The above figures are in striking contrast to the figures for Britain published by the British Electricity Authority's annual report for 1954-55:

Revenue per unit sold.	
Domestic	1.518d. per unit
Industrial	1.149d. per unit

Also redistribution losses:

Total units generated in New Zealand	4,748,334,344
Total retail sales	3,876,311,009
Loss	872,023,335
Percentage loss	18.4%

So gas at 20% has a close competitor in electricity. In New Zealand the practice is not to correct gas production figures for temperature and pressure. The figure of 20% is, therefore, in effect only about 16%. In Britain there are 145 consumers per mile of main as against 80 in New Zealand. In Britain gas sold per consumer per annum is 200 therms; in New Zealand only 100 therms. Under these conditions the distribution losses in New Zealand compare more than favourably.

A number of our undertakings have been put out of business by this unfair competition and this in a measure accounts for the decline in the overall figures, but I say definitely that the gas industry here has not 'thrown in its hand.' It is holding on tenaciously and after many long years of battle the Government has at last declared the gas industry to be essential to the country's economy. With some relief from gas being installed in new Government housing areas and the rapid increase in the industrial and commercial load it would seem that the industry is turning the corner upwards.

The recent publicity given to gas by *Live Lines* has a distinct propaganda flavour. Your English readers should know that the various electric authorities in New Zealand would like to step in and take over gas undertakings at scrap value, but it is not going to work out that way. British gas people should take heed. What has happened with unfair competition in New Zealand can happen in Britain. The political control of both fuel services, gas and electricity, needs an overhaul. My advice to British gas people is, tackle this unfair trading aspect right now when it is in its infancy. Not only gas interests, but the public generally will suffer in the long run if unfair electric trading is allowed to gain a foothold.

I thank you for affording me space in your columns in the past. The traditional British freedom of the Press is a great safety valve. I am only sorry that the Editor of *Live Lines* does not afford me similar facilities.

Yours faithfully,

RUPERT WORLEY.

Auckland Gas Co., Ltd., Auckland, New Zealand.

Personal Notes

MR. JAMES HERBERT CLEGG has retired after almost 50 years in the gas industry. Mr. Clegg, at retirement, was District Service Manager at Accrington, Lancashire, under the North Western Gas Board. During his career he has served as Engineer and Manager at Burnley, Southport, and Church. He was, prior to retirement, Treasurer of the Manchester and District Association for several years.

ALDERMAN F. G. EXTON has been appointed Deputy Chairman of the North Thames Gas Consultative Council in succession to MRS. ALICE TOPPING, with effect from August 12. ALDERMAN W. W. FARTHING has been appointed Deputy Chairman of the Eastern Gas Consultative Council in succession to Mr. C. H. Frewer, with effect from July 23. MRS. HANNAH HARRY has been appointed Deputy Chairman of the Wales Gas Consultative Council.

MR. WILLIAM E. JOWSEY, a constructional engineer who went to Australia several years ago for Ashmore, Benson, Pease & Co. Ltd., was killed in a recent explosion at Wagga gasworks. He took a leading part in the erection of the Freemantle C.W.G. plant and several other projects.

DR. D. T. A. TOWNEND, C.B.E., Director-General of the British Coal Utilisation Research Association, and DR. A. C. MONKHOUSE, Director of the Fuel Research Station of the Department of Scientific and Industrial Research, have been appointed members of the Fuel Efficiency Advisory Committee.

ALDERMAN HUW T. EDWARDS, part-time Member of the Wales Gas Board, received an Honorary Degree of LL.D. at the degree congregation of the University of Wales at the City Hall, Cardiff, recently.

MR. ARTHUR TAYLOR has retired from the Managership of the National Coal Board's By-product Plant at Bearpark after 51 years' association with coke production.

MR. W. C. ANDERSON has been appointed General Secretary of the National and Local Government Officers' Association in succession to MR. J. H. WARREN, who retired last month.

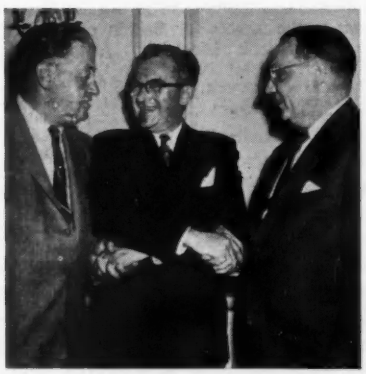
MR. W. A. HARTOP, Works Director of George Kent, Ltd., has left London on a round-world tour, the main object of which is to stimulate and expand the firm's export markets.

MR. PETER DAVIES, a member of the Legal Department of the Wales Gas Board, is a member of the Llanelly Rugby Club which is due to arrive in Moscow today to take part in the Russian Youth Festival. Mr. Davies is a former captain of Cambridge Rugby Union.

MRS. G. EVERSHED has been elected Chairman of the Women's Gas Federation on the completion of MRS. G. ABBOTT'S two years term of office this month. Mrs. Evershed has been a member of the Federation for nine years, is Chairman of the West Ham Branch, and President and Founder of the Wanstead and Woodford Branch. For the past four years she has served on the National Executive and General Purposes Committees of the Federation. Her outside interests cover the organising of the W.V.S. Meals on Wheels Service for old people in Walthamstow in addition to being a member of the Leyton Home Safety Committee and the Executive Committee of the Wanstead and Woodford Community Association. On two occasions Mrs. Evershed has acted as hostess to 'Mrs. America' when she visited this country. Mrs. Evershed is married to a solicitor and has two daughters, one has completed her training as a physiotherapist and the younger will be taking up medicine in the autumn. Mrs. Evershed is herself a chartered physiotherapist.

Mrs. G. Evershed.

ANNIVERSARY DINNER



With V. D. MacLachlan, Sales Director and General Manager, of Honeywell-Brown, Ltd., at his 20th anniversary dinner party are (right) E. C. Vorlander, Managing Director, and (left) O. B. Wilson, Vice President of the Company's associates in Philadelphia.

Diary

July 25.—NORTH THAMES G.C.C.: Caxton Hall, Westminster, S.W.1.

July 26.—EAST MIDLANDS G.C.C.: Nottingham Chamber of Commerce. 3 p.m.

July 29.—EASTERN G.C.C.: Connaught Rooms, Great Queen Street, Kingsway, W.C.2. 2.30 p.m.

July 29.—SOUTHERN G.C.C.: No. 1 Committee Room, The Civic Centre, Southampton, 11 a.m. Annual Report for 1956-57.

Calendar & Directory Alterations

The following changes have been notified recently. To keep the information in the current issue of the 'GAS JOURNAL' Calendar and Directory up to date readers are invited to note these alterations in the Directory Section.

Page D22.—GRANTHAM GROUP: F. L. Harrison, *Group M.*, vice J. E. Young.

Page D24.—SHEFFIELD AND ROTHERHAM: T. H. Crompton, *Divisional Stores and Purchasing Officer.*

Page D27.—EASTERN GAS BOARD: Delete S. A. King, *Commercial M.*

Page D81.—SOUTHERN GAS BOARD: G. D. Phillips, *Publicity M.*

Page D82.—SOUTHAMPTON REGION: J. F. Doran, *Sales and Service M.*

Page D86.—ANGLESEY GROUP: Delete A. I. Jones, *Chairman*, retired.

Page D89.—EAST GLAMORGAN GROUP: Delete D. Muir, *Deputy Chairman*, retired. Pontypridd: L. Gray, *E. & M.* vice D. Muir.

Page D95.—WEST MIDLANDS GAS BOARD: J. Swan, *Secretary*, vice J. C. Ingram.

Page D107-116.—SCOTTISH GAS BOARD: For details of major administrative changes see 'GAS JOURNAL,' March 20, p. 609, May 29, p. 507, July 3, p. 29, July 10, p. 79.

Page D121.—LONDONDERRY GASLIGHT COMPANY: R. McDougall, *E. and M.D.*, vice G. Walmsley, retired; R. A. Rankin, *Secretary.*

Page D126.—PORT ELIZABETH: Make 255 mill., Cons. 2,120 dom.

Page D144.—EASTERN SECTION: D. B. Parkinson, *Chairman;* S. E. Balsom, *Senior Vice-Chairman;* R. J. Gavin, *Junior Vice-Chairman.*

Page D145.—MANCHESTER AND DISTRICT SECTION: R. L. Greaves, *Chairman;* J. G. Tilley, *Senior Vice-Chairman;* A. H. Nicholson, *Junior Vice-Chairman;* J. Castle, *Hon. Secretary;* J. H. Clegg, *Hon. Treasurer.*

Page D159.—SOCIETY OF BRITISH GAS INDUSTRIES: Sir Charles Bruce-Gardner, *President;* L. J. Walker, *Chairman;* S. N. Turner, *Vice-Chairman.*

Sc.G.B. Introduces Single All-purpose Tariff

COSTS AND BENEFITS MORE FAIRLY SHARED BY ALL CONSUMERS

THE Scottish Gas Board has replaced its 24 separate price systems with a simplified all-purpose tariff, making the price of gas uniform throughout the country. The Board believes this will ensure that consumers share more fairly the cost of the service supplied to them and the benefits of improved operating efficiency.

The new tariff incorporates an increase averaging 1.3d. per therm. The effect is that average households will pay 6d. a week more for gas. Edinburgh consumers will have to pay on the average 1s. a week more, and those in Glasgow, Aberdeen, and Dundee about 10d. On the other hand, in 74 communities—mainly smaller towns and villages—domestic consumers will pay less than before.

Rising Costs

Discussing the new charges at a Press conference, Mr. Sydney Smith, Chairman of the Board, said the increase had been made necessary by rising costs. Although the Board was saving £500,000 a year through reorganisation and increased efficiency, it had to meet increased charges for gas oil and petrol amounting amounting to £28,000; wages and salaries £284,000; coal and coke-oven gas, £876,000; freight, £144,000. After deducting £393,000 credit from authorised increase in coke prices this left a total of £939,000.

The old tariff, Mr. Smith continued, was designed to relate the price of gas at each undertaking to the local cost of making and distributing it. A number of undertakings in remote parts of the area, where costs were so high that they could not be covered on this basis, had had to be subsidised from the general revenue.

These tariff principles had become outdated. The number of undertakings was being reduced and as small undertakings were merged with larger ones their costs merged also and the whole basis for the determination of local costs disappeared.

Radical Revision Necessary

Capital expenditure was incurred to secure the maximum efficiency of the Board's operations as a whole, and the benefits which might be expected from the availability of gas from outside sources—coke ovens, etc.—should be distributed throughout the area rather than confined to districts in which those sources existed.

With these considerations in mind, the Board had decided that, to make the most of the developing nature of the industry in Scotland, a radical revision of tariffs was necessary.

The new tariff is:

Quarterly Consumption	Rate in pence per therm
First 24 therms	29
Next 1,200 therms	19
Next 15,000 therms	18
Next 15,000 therms	17½
Remainder over 31,224 therms	15

The prepayment supplement of one penny per therm will continue to be charged on the first block of the tariff, reduced from 27 to 24 therms. An optional domestic two-part tariff with a standing charge of 39s. per quarter for credit consumers and 41s. per quarter for prepayment consumers, with all gas at half the price of the first block, is also proposed to encourage domestic consumption. The Board will be prepared to negotiate special agreements with non-domestic consumers to encourage industrial consumption.

More Gas Price Increases Are Announced

AN increase of 2d. per therm has been announced by the Northern Gas Board. The Chairman, Mr. E. Crowther, said the increase was equal to about 8%, and was 'more or less in tune with the increase in coal prices.'

The Board was helpless to resist the forces of inflation of which it is a victim and not an accessory, the Chairman added.

The Board's surplus last year, estimated at £870,000, had been 'swallowed up by the latest cycle of increases in costs.'

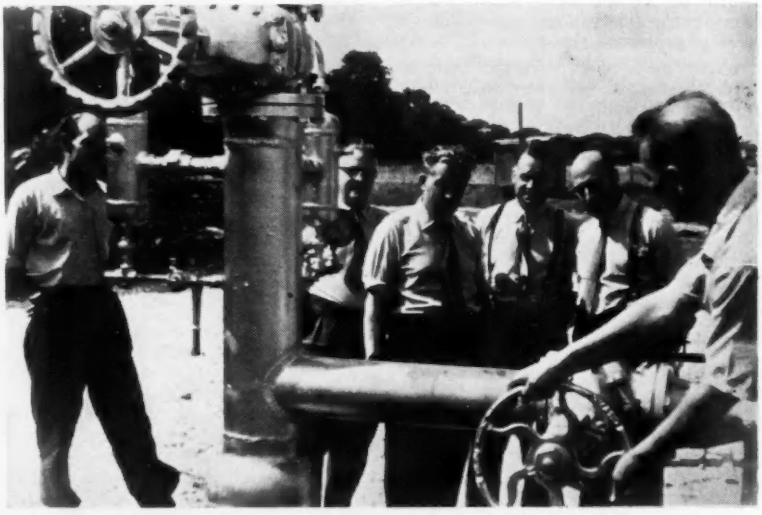
Gas prices are also to be raised by the West Midland Gas Board, Mr. G. le B. Diamond, Chairman, warned on Monday. He did not, however, state the amount of the increase.

MR. THERM MAKES A SPLASH

PROMINENT cover positions on a wide range of trade and technical journals are currently being exploited by the Gas Council to spotlight the industrial use of gas.

Some 500 reservations have been made for these positions. In addition inside support is being given by specially prepared editorial-type advertisements and double page displays which deal specifically with the varied operations performed in industry by the fuel.

A feature of the front cover design is 'Mr. Therm's Library List,' the suggestion of Mr. R. J. Gregg, Gas Council Publicity Manager. This carries space for insertion of names of executives—an idea appreciated by departments of firms responsible for the internal distribution of journals.



Pictured when the valve was turned on at the link-up of the refining pipe from Fawley refinery of the Esso Petroleum Co., Ltd., with the Southampton works of the Southern Gas Board, are Mr. G. Neil, Regional Production Engineer, fourth from the left; Mr. R. K. Harrison, Regional Distribution Engineer, third from the left; and Mr. W. F. Thorne, Chief Chemist, Southern Gas Board, second from the right. At present the refinery gas is being reformed in existing water gas plants. Two sets of O.G. catalytic oil and refinery gas reforming plant and ancillary plant are to be erected at Southampton works at a later date.

Association Technique de l'Industrie du Gaz en France Holds Annual Conference

THE 74th Conference of the Association Technique de l'Industrie du Gaz en France was held in Bordeaux from June 11-15 under the Presidency of M. G. Nérot, General Secretary of Gaz de France. M. Nérot was supported on the platform by M. Le Guellec, Chairman of the Administrative Council of Gaz de France and M. Combet, Directeur Général of Gaz de France.

There were also 27 delegates from foreign gas associations including Professor M. Boselli, President of the International Gas Union; Dr. J. Burns, President of The Institution of Gas Engineers; M. A. de Brouwer, President of the Association Royale des Gaziers Belges; Dr. H. Bausch, President of the Deutscher Verein von Gas und Wasserfachmännern; and Mr. M. Schenker, President of the Schweiz. Verein von Gas und Wasserfachmännern. Other countries represented included Austria, Denmark, Spain, Italy, Luxemburg, Holland, Poland, Sweden, and Czechoslovakia. M. Nérot welcomed the foreign delegates and assured them that their attendance was much appreciated.

Honorary Members of the Association were elected or re-elected including M. Le Guellec, Chairman of the Administrative Council of Gaz de France; M. Maisonneuve, Chairman of the Administrative Council of Electricité et Gaz d'Algérie; M. Chaban-Delmas, Chairman of the Gas Department of Bordeaux; M. Verret, Chairman of the Administrative Council of Charbonnages de France; M. Raty, Chairman of the Chambre Syndicale de la Sidérurgie; and the Presidents of the International Gas Union and foreign gas associations.

Eighty-nine new corporate members and 24 associate members were elected to the Association.

Before presenting the reports of the Council and of the various committees, the President expressed the gratitude of the Association to the Deputy Mayor of Bordeaux for the hospitality extended to the Association. He recalled that the Association had previously met at Bordeaux in June, 1885, but none of those who then attended was still alive to recall his memories of the meeting. There had been 24 papers presented at that meeting one of which was of especial interest—M. André Coze had described the inclined retorts which he had just invented and from which it might be said that the present-day continuous and intermittent vertical retorts were but an extrapolation pushed to its limit.

The President paid tribute to M. Roget Cadel, Honorary Member, and 15 Members whose deaths had occurred during the year.

The report of the Committee on Manufacture was presented by M. Papillon who referred to the study which the Committee was making on the complex problem of the effect on gas techniques of the consideration of energy requirements generally. Side by side with these major problems the Committee had continued its investigations of the more immediate problems with which it was particularly concerned, he continued. Two further chapters for the Monograph on Gasholders had been prepared during the year and others were in preparation. It was expected that this work would be finished during the forthcoming year.

The Connétables de Guyenne welcome the ladies to the Château des Ducs d'Epernon à Cadillac.

A study on 'Modern processes used in coke oven plants for the physical and chemical treatment of gas' and another on 'Specifications for the construction of new installations' were being undertaken on behalf of the International Gas Union.

The report on distribution was given by its Chairman, M. Arnould. Volume I of the Manual on Transport and Distribution would be available in the very near future and work on the editing of Volume II was well in hand. The Code relating to installations of town gas in houses was being revised and would deal not only with town gas but also with natural gas, neat propane and propane-air mixtures. It would also refer to gases distributed at medium pressures. Investigations were being made into the standardisation of governors and distribution problems in multiple dwellings. In connection with the International Gas Union, M. Amsler was to present a paper on 'Problems associated with the transport of manufactured gas over long distances at high pressure.' M. Nérot and M. Renauldon were co-operating with the work of the International Committee for the Study of New Gas Distribution Techniques.

M. Coudeville, in presenting the report of the Committee on Utilisation, referred to the attention that had been paid to the standardisation and sampling of gas appliances and equipment including flexible tubes in rubber and in plastic materials.

Radiant panels had been studied with a view to establishing the conditions under which they may be used for heating public buildings.

Ventilation had also been a subject considered by the Committee which in particular had studied the ventilation of premises where gas appliances using heavy gases were installed. It was hoped that tests recently carried out at Genevilliers would provide an answer to this problem.

In the absence of MM. Clapier and de Sacy, Chairman and Vice-Chairman of the Committee on Coke, Tar, Benzole and Derivatives, the report was given by M. Lihrmann. Work had continued on the standardisation of cokes but the study of 'Problems relating to tarry condensates' had unfortunately had to be postponed temporarily.

Several members of the Committee had again considered throughout the year the pollution of the atmosphere by dust, odours, and fumes from gasworks and coke ovens and a report on this subject was to be presented at the next international gas conference. New pro-

cesses in the refining of benzole had also been studied.

M. Quéret, Chairman of the Committee dealing with education and training and with technical literature, presented his Committee's report. He recalled that the year had seen the initiation of the 'Ecole d'Application des Techniques Gazières' which had replaced the 'Centre d'Etudes Supérieures Gazières' inaugurated in 1930. The success of this first course indicated that the new school ought to equal or even surpass its predecessor. There were 67 applicants for the course of whom 26 were accepted (22 from Gaz de France, two from Electricité et Gaz d'Algérie, one from Belgium, and one from Portugal). The course terminated with a study tour of works at Bayonne, Lacq, Pau, Tarbes, Toulouse, Sète, Frontignan and Montpellier.

M. Quéret also referred to the 'Cours Commerciaux' and the 'Cours de Perfectionnement' which are regular features of the educational programme of the French gas industry.

In the field of technical literature there had been considerable activity. The Committee was playing an important part in the work of the Vocabulary Committee of the International Gas Union, now preparing a vocabulary for the gas industry in seven languages.

The documentation department of the Association continued to function. The number of reviews and translations sent out had grown from 250 in 1928 to 7,600 in 1956 (including 4,000 translations). In 1956 also it prepared 432 translations and 8,600 photographic copies of technical articles.

Prizes were presented by the President, M. Nérot, to those whose contributions to the 1956 Conference were considered the best. The following awards were made: 100,000 francs to M. G. Venzac; 80,000 francs to MM. J. Reboul and P. Gross; 70,000 francs to MM. Prévot and J. Allain; and 50,000 francs to M. J. Henry.

A medal was presented by the President to M. G. Méker who had been a member of the Association for 50 years. In relating the long career of the medallist the President referred to his innovation in 1903 of the well-known burner

Seen at the Château Mouton-Rothschild —Dr. J. Burns, President of the Institution of Gas Engineers (left) with Mrs. Triplat and Mr. Triplat, General Manager of Municipal Services, Klagenfurt, who represented the Austrian Association of Gas and Water Engineers.

which bears his name and which has contributed so much to the development of industrial gas usage.

The Society of Civil Engineers had awarded the Nicolas Fortin Prize to him in 1944 and in 1952 the Government had recognised his services by making him an Officier de la Légion d'Honneur.

The Council for the ensuing year was elected, M. Bolzinger being elected to follow M. Nérot as President.

There then followed a report from M. Dagault, Director of the Société pour le Développement de l'Industrie du Gaz en France on the work of the Society and a number of coloured slides were shown of the stands and pavilions which had been prepared by the Society for various exhibitions during the year.

M. Nérot's Presidential Address on the Future Prospects of the Gas Industry provided an excellent termination for a long but most interesting session.

The rest of the business sessions were devoted to the presentation and discussion of technical papers of which there were 40, covering a wide range of subjects of technical interest in the gas industry.

In an address, the Chairman of the Administrative Council of Gaz de France, M. Le Guellec reviewed the energy requirements of the world and of Europe, the industries concerned with supplying these requirements, and the contribution of the gas industry.

A number of works visits were arranged and included a shipyard, a glass works, a biscuit factory, an oil refinery, an aircraft factory, an accumulator factory, and the gasworks at Bordeaux where, in a relatively compact plant, the whole of the gas requirements of the town are produced by refining natural gas in a continuous catalytic reforming plant of the Hercules Powder Company's type.

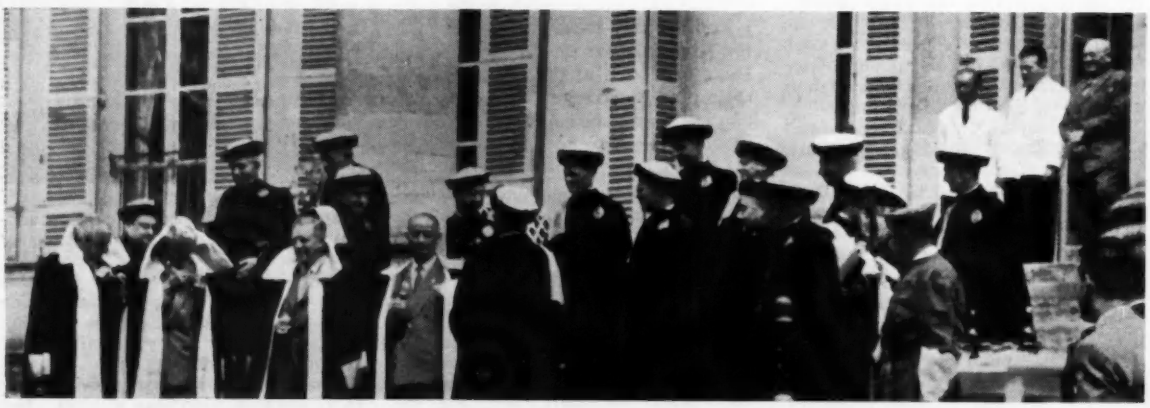
An interesting programme of visits was arranged for each afternoon of the Conference for the ladies, including a tour of Bordeaux, and visits to ruins at Saint Emilion, a biscuit factory and a liqueur factory, and to a number of châteaux.

On the social side there was a reception by the Deputy Mayor of Bordeaux at the Town Hall followed by a dinner given by the Association Technique de l'Industrie du Gaz en France for the foreign delegates and other invited guests. Dr. Boselli, President of the International Gas Union replied on behalf of the foreign visitors to a toast proposed by the President, M. Nérot.

A special performance of ballet was arranged by the municipal authorities in the magnificent Opera House, one of the most beautiful in France, followed by a dance in the foyers of the Opera House.

The Conference closed with a coach trip through the vineyards of the Médoc and visits to some of the châteaux where the wine is made. At one of these—Château Margaux—the four Presidents of foreign delegations, Dr. Boselli, Mr. de Brouwer, Dr. Burns, and M. M. Schenker, together with a number of officers of the Association Technique de l'Industrie du Gaz en France including M. Nérot, M. Le Guellec, M. Combet, and M. Lihrmann, Secretary, were installed as Commandeurs de l'Ordre et Compagnons du Bontemps de Médoc. Each was presented with an imposing certificate.

After lunch at the Château, the coach trip was continued through beautiful country to Arcachon where a reception was given at the Casino Mauresque.



The Compagnons du Bontemps de Médoc at the Château Margaux. Dr. J. Burns, President of the Institution of Gas Engineers, who was among visitors installed as honorary Commandeurs is seen fifth from the left.

S.E.G.B. LAUNCHES NEW COLLIER

Board's First Ship from Aberdeen Yard

THE South Eastern Gas Board's new motor vessel, Dulwich, launched at the yard of Hall Russell & Co., Ltd., Aberdeen, recently, was named by Mrs. A. G. Gostelow, wife of the Board's Coal and Shipping Manager.

The Dulwich, of the up-river design, is a sister ship of the recently commissioned m.v. Kingston. She will trade between North Coast ports of England and the Board's three discharging jetties, East Greenwich, Rotherhithe, and Wandsworth.

At the luncheon which followed the naming ceremony, Mr. Howard Johnson, Managing Director of the Burntisland Shipbuilding Company (Hall Russell & Co. are included in this group of companies) said it was impossible to think of this type of vessel without thinking of the gas industry: The particular interest for shipbuilders lay in the need to transport coal from the collieries to the gasworks and ships for special service had long been built from the designs of the Chairman of the Company, Sir Wilfred Ayre.

Memorable Occasion

Mr. W. K. Hutchison, Chairman of the South Eastern Gas Board, said this was a memorable occasion as the Dulwich was the first ship launched for the Board at Aberdeen. It was a particular pleasure to be at this launching because it was a compliment to a man and his wife who had done so much for the South Eastern Gas Board. 'I cannot speak too highly of Mr. Gostelow,' said Mr. Hutchison, 'and it was the unanimous wish of the Board that Mrs. Gostelow should name this ship.'

Of the future, Mr. Hutchison said that, although coal was the right product, owing to its cost the gas industry must look to other material for the manufacture of gas, and oil would undoubtedly be used to a greater extent. But the Board would still be dependent on coal. As about 80% of its supplies were received from Durham collieries, ships would be required for a long time.

In conclusion, Mr. Hutchison wished Captain J. B. Dry, the Master Designate, many years of happy service.

Mr. A. G. Gostelow, Coal and Shipping Manager, said he was deeply touched by the kind reference made to him by his Chairman. On behalf of his wife, he expressed his appreciation of the courtesy extended to her. Speaking of Captain Dry, Mr. Gostelow said he was sure the Dulwich would be in good hands.

Mr. John Wright, Managing Director of Hall Russell & Co., Ltd., complimented the 'Lady of the Day' on the successful way in which she had undertaken the naming ceremony.

At the launching ceremony, left to right, are Mr. Stanley Johnson; Mrs. Howard Johnson; Mr. E. Knight; Mr. A. H. Savill; Mrs. A. H. Savill; Mr. Howard Johnson, Managing Director, Burntisland Shipbuilding Co., Ltd.; Mr. John Wright, Managing Director, Hall Russell & Co., Ltd.; Mr. A. G. Gostelow; Mrs. A. G. Gostelow; Mr. W. K. Hutchison, Chairman, South Eastern Gas Board; Mrs. W. K. Hutchison; Mr. A. E. Dean; Sir Wilfred Ayre, Chairman, Burntisland Shipbuilding Co., Ltd.; Lady Ayre; Mrs. A. E. Dean; Mrs. Stanley Johnson; and Mrs. John Wright. Mrs. John Dry and Captain John Dry, Master Designate, of the m.v. Dulwich are at the extreme right.

Keith Blackman Turnover Increases in Spite of Difficult Conditions

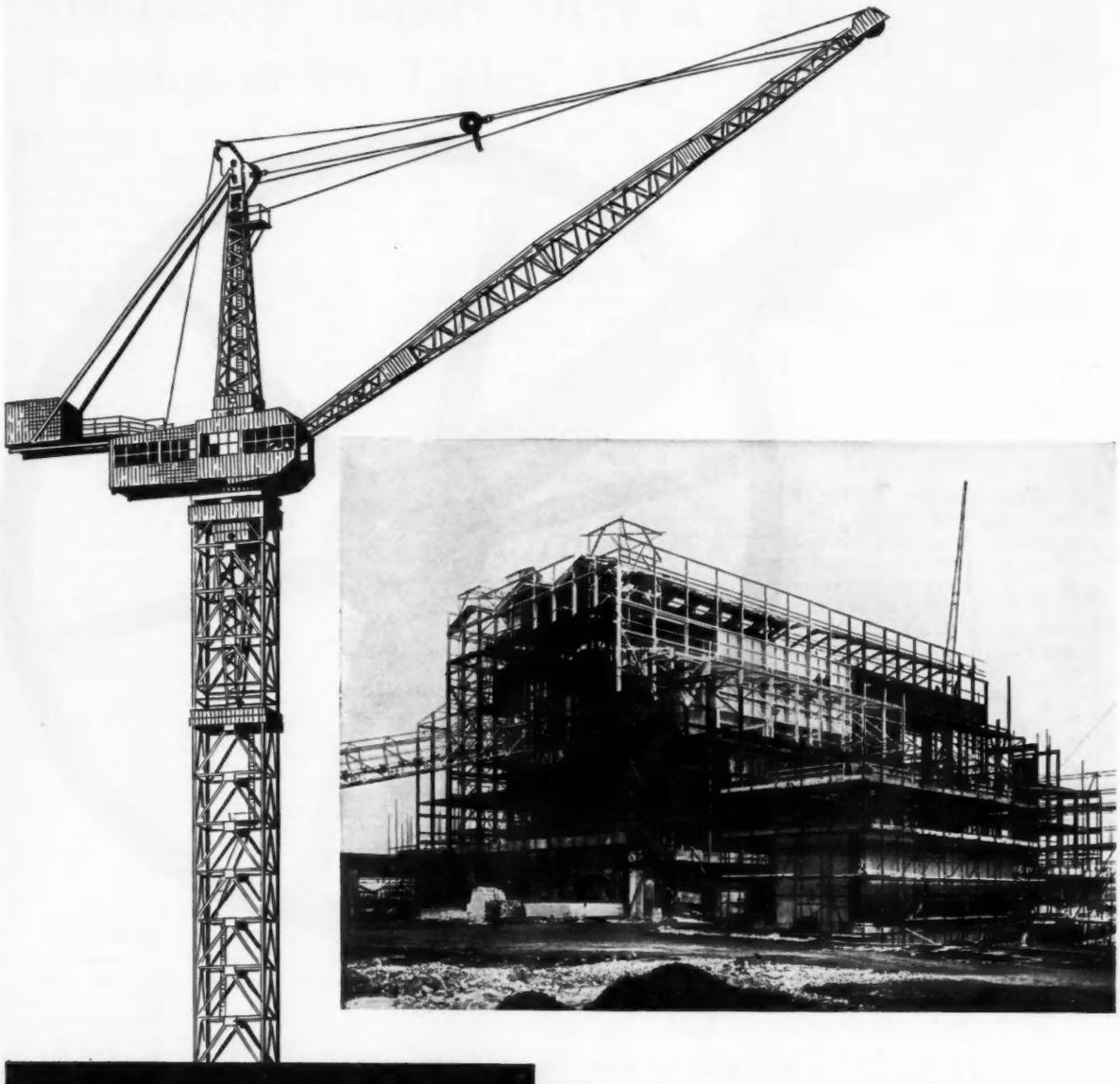
SEVERE competitive conditions, instability of the labour position, and the inflationary trend leading to higher production costs, had persisted during the financial year under review, Mr. D. S. Woodley, Chairman and Managing Director, stated at the annual general meeting of Keith Blackman, Ltd. 'In spite of this, however, we made an appreciable increase in our turnover and this has helped considerably in our efforts to avoid any serious price increases in our products,' he added.

'Considered against a background of the most difficult conditions which prevailed, I think that the ability of the Company to continue to make a substantial profit can be regarded as a measure of satisfactory progress.

'Having in mind the somewhat unstable conditions under which particularly an engineering business has to operate in present times, the continuity of inflationary costs of new and replacement plant, machinery, etc., and the possibility of further building extensions being needed in the near future to provide additional working space to enable us to keep pace with the demands for a continuing rise in production, the building up of substantial reserves becomes most essential.

'This year, therefore, your Directors have again recommended the setting aside of £75,000 under this heading which will bring our general reserve account to £450,000.'

Recommended ordinary dividend is 15%, less tax, absorbing £51,750. Net profit for the year is £342,239; carry forward, £138,378.



NOW UNDER CONSTRUCTION

The W-D Recuperative Intermittent Vertical Chamber Installation at the Lancaster, White Lund Works of the North Western Gas Board. 54—3¾ ton chambers capable of carbonising 418 tons of coal daily and producing therefrom 6¾ million cu. ft. of 475 B.Th.U. gas.

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a measure of importance—

This early 19th century Perambulator was used for measuring distances over land. Of course friction, wheel slip, back lash and surface irregularity, among other things, rendered it inaccurate. On the other hand experience, technical resource and modern production techniques within the integrated U.G.I. group have evolved meters built upon known sound principles— such meters offer prolonged accuracy throughout a long life.

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Manchester Juniors Meet at Partington for Ladies' Day

PARTINGTON gasworks was the focal point of Ladies' Day of the Manchester Juniors. With their President, Mr. T. Nicklin, members were entertained to lunch by the North Western Gas Board and were welcomed by the General Manager of the Manchester Group, Mr. John Wilson. A reply on behalf of the ladies was given by Mrs. H. Partington.

Following lunch, the party of about 120 was divided into three groups. For one group a trip by launch around the Manchester docks and down the Ship Canal had been arranged. The party was taken to the dock headquarters by coach and then down the canal in a river bus as far as Barton aqueduct.

A second party took part in a small whist drive which was won by Mr. and Mrs. Broadbent of Liverpool; while a third party inspected Partington works, visited by the Duke of Edinburgh two years ago.

The three parties joined for tea in the works canteen and a vote of thanks was proposed to the North Western Gas Board by Mr. H. Partington. Mr. Olver, Manchester Group Production Engineer, replied.

Following tea, a dance was held in the works assembly room.

Change of Address

The London offices and sales depôt of Sir W. H. Bailey and Co., Ltd., have been removed from 4, Domingo Street, E.C.1, to new and improved premises erected at Selinas Lane, off Whalebone Lane South, Dagenham, Essex (telephone No.: DOMinion 2277/8/9).

Foundation Stone Laid

The foundation stone of the administrative block of the British Tyre and Rubber Company's new factory at Farington, Lancashire, was laid on July 9 by the Chairman of the Company, Sir Graham Hayman.

Successful Candidates

Among successful candidates in the Institute of Municipal Treasurers and Accountants examinations in May were Mr. John Blackburn, of the Accountant's Department, North Eastern Gas Board, Huddersfield Group, Miss Margaret Pratt Smith, of the Finance Department, Scottish Gas Board, Dundee Group, and Mr. Ronald Alcock, of the Chief Accountant's Department, North Western Gas Board.

THE AUTOBAGGER

The London housewife gets her first delivery from the new Charrold 'Autobagger'—the new semi-automatic coal delivery lorry. Coal is seen being loaded into a specially tared sack and the coalman is pointing out the weighing counter which keeps an accurate check on individual and total deliveries.

Pictured here is the coke section of the Gas Council stand at this year's Royal Show at Norwich. The feature of the section was a display of various types of grain drier.

N.T.G.B. Awards 35 Medals for Gallantry

CONTINUING a tradition of the former Gas Light and Coke Company, the North Thames Gas Board has instituted a medal, specially struck in silver, to be awarded to its employees in recognition of acts of gallantry by them, not only for special bravery in the line of duty, but also for courageous actions outside it.

The first 35 presentations of the medal were made last month in the Board Room at Kensington by Mr. R. N. Bruce, Deputy Chairman of North Thames Gas Board. Since vesting day examples of gallantry have been recognised by special awards by the Board, but it was always intended that these should be supplemented by the award of the Board's medal when it was instituted. In future, each presentation will be made shortly after its award is announced.

Making the presentations, Mr. Bruce said the examples of selfless courage shown in various kinds of emergency were an inspiration to everyone.

IRISH MAIL BOAT IS INSPECTED

THE Ladies' Day meeting of the North Wales Section of the Wales and Monmouthshire Junior Gas Association took place on June 22 at Holyhead. Thirty members and their ladies, with Mr. H. Potter, Chairman, were present.

The members were shown over an Irish mail boat, at the Holyhead railway docks, after which they visited the South Stack lighthouse. The day was completed with a coach tour of the coast near to Holyhead.

Defence Chief Sought

The Scottish Gas Board is looking for a Civil Defence expert to streamline the Board's anti-nuclear defence organisation. The job carries a salary of £22 a week and a pension.

Whessoe Ltd., Orders Continue at High Level, Chairman Reports

ORDERS received by Whessoe, Ltd., during the year ended March 31 last were again at a very high level, and in spite of increased production, the value of work still to be done is considerably in excess of any previous year, Mr. C. M. Spielman, Chairman, stated in his speech accompanying the annual report.

For the most part they include those for oil storage tanks, oil refinery columns, a record number of spheres and growing volume of stainless steel work.

Although competition at home and abroad is becoming increasingly severe, so that profit margins must always be 'critical,' the industries which are principally served are likely to expand for many years to come.

There should be continued expansion in production, subject to the availability of heavy steel, particularly plates. Meanwhile, the order book is such as to ensure full working in all departments during the current year.

Widening interests during the year under review resulted in the value of production exceeding that of any previous year by over 25%.

During the year net assets increased from £2,426,175 to £2,777,762, and fixed assets from £1,401,413 to £1,836,858. Commitments are estimated at £227,000 (£605,000).

Net profits were higher at £486,712 (£414,789) and the dividend is increased 2½% to 22½%.

Simon-Carves, Ltd., Have Large Export Orders on Hand

NOT only is the value of contracts in hand a record for the Company, but about 40% of this value is for export, Mr. R. B. Potter, Chairman, stated in his speech accompanying the annual report of Simon-Carves, Ltd.

'As forecast last year, the profits before taxation are about the same as those of 1955,' the chairman said. 'This can be considered very satisfactory, as we have incurred fairly heavy expenditure on certain new work; in particular, the substantial development and administrative costs of nuclear power have been almost entirely charged against profits.'

Consolidated net profit after taxation is £686,618 of which £208,664 has been retained by subsidiary companies, leaving a net profit for the year available for appropriation by Simon-Carves Ltd. of £477,954. The Directors have made the following appropriations to reserves: Special depreciation reserve, £40,000; special taxation reserve, £45,000; nuclear power development reserve, £100,000. An interim dividend of 7½%, less tax, was paid in December, 1956, and the Directors now propose a final dividend of 12½%, less tax, which together absorb £172,500, leaving a balance of £120,454. To this is added the amount brought forward from 1955, £600,170, making a balance to be carried forward to 1957 of £720,624.

Fall in Demand Was Beyond Our Control, Says Meters, Ltd., Chief

THE fall in demand for their principal product, the domestic gas meter, had continued throughout the past financial year and while they believed they were obtaining substantially the same proportion of the available business as in many previous years, the fall in demand had been on a national basis and was a matter beyond their control, Mr. V. A. B. Hughes, Chairman, said at the annual general meeting of Meters, Ltd.

The results shown in the Directors' report, a fall in the total amount available after payment of tax from £52,563 to £33,348, were very disappointing and as a consequence the Board had reluctantly decided to recommend a reduction of the final dividend from 4% to 3%, making the total distribution 6%, against 7% last year. The balance carried forward was reduced by £7,203.

They were continuing to spend considerable sums on research and development. These might not yield immediate results but the Board felt that this work would contribute to the future prosperity of the Company.

600 Group Ltd.

Combined profits of the George Cohen 600 Group, Ltd., for the year ended March 31, 1957, before taxation, amount to £2,336,628 against £1,856,808 in the previous year, the annual report reveals. Combined profits of the Group, after all charges including taxation and interest on unsecured notes, is £1,097,686 against £889,991. Final dividend is proposed on £3.125 mill. ordinary stock at 8.5% actual, less tax, absorbing £152,735 against 7.5% on £2.5 mill. absorbing £107,813.

COALITE NET PROFITS RISE BY £46,500

DEMAND CONTINUES TO EXCEED SUPPLY

NET profit of Coalite and Chemical Products Ltd., for the year ended March 31, 1957, was £333,333, an increase of £46,567 over the previous year the Chairman, Commander Colin Buist, M.V.O., R.N.(ret.), stated at the annual general meeting.

'In spite of the unprecedented mildness of the winter and the increase in the output, the demand for Coalite continued to exceed the available supply until the middle of March,' the Chairman said. 'By that time the mild winter had changed to premature summer. The position was aggravated by the anticipation that an increased differential between winter and summer prices would be introduced at the end of April.

'For the first time for many years there was a temporary surplus of every type of domestic solid fuel, and quantities of Coalite had to be put into stock. With the introduction of summer prices on April 29, coupled with the return to more normal weather, the position changed overnight and the demand was restored to the normal level.'

The demand for oils and chemicals had been well maintained, although there was a tendency for a return to seasonal trading conditions in the case of a few isolated products.

Substantial Contribution

Their production of petrol and diesel oil was increasing during the period of the Suez crisis, and they had been able to make a substantial contribution to the needs of consumers. References in the Press to the attempts that were made during the crisis to use coal tar fractions as substitutes for diesel oil should not be linked with the Company's Coalene diesel oil which has been used extensively with every satisfaction for nearly 20 years by a number of public transport undertakings and other consumers.

They had various assets that were extremely valuable when considered in relation to any new competition that might arise. The intensification of machine mining resulted in a continued increase in the amount of small sized coal produced at the expense of large. It was fortunate, therefore, that their process converted small coal into large domestic fuel.

The development of smokeless zones was proceeding apace and it was fortunate also that they produced a reactive solid smokeless fuel ideal both in size and performance for replacing coal for domstic use.

Final dividend of 9½% is recommended absorbing £87,659 (against 9%, £83,046) making 12½% (12%). Balance carried forward in the consolidated balance sheet is £146,438 (against £127,289).

The Manufacture of Town Gas from Liquid or Gaseous Fuels*

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Gas Engineering Dept., The Power-Gas Corporation Ltd.

THE post-war years have seen the gas industry turn more and more from its traditional method of manufacturing gas by the carbonisation of coal. This change was evident earlier on the Continent than here owing to the more rapid exhaustion of good quality coals. It is a process which has accelerated rapidly in this country in the last few years.

The coal supplies on which our industrial life depends are becoming increasingly difficult to remove from the ground. This is a limitation not yet suffered by oil and it is not surprising, therefore, that the price of coal has risen faster than the price of oil products.

Coal production in this country is at present at a level of about 220 mill. tons per year and it does not appear that it is likely to rise very much in the next ten years or so, if ever. Consequently, it is unlikely that we shall be able to look to coal to provide much of the extra power on which the increased standard of living for which we hope must depend.

It is anticipated that by 1964 the total consumption of energy in the United Kingdom will have reached the equivalent of nearly 300 mill. tons of coal. Most of the increase from the present level of 250 mill. tons will have to be provided from oil since the output from other sources such as atomic energy will still be very small and only oil production will be capable of the rapid expansion necessary.

As far as the gas industry is concerned, this means that the utilisation of oil and refinery products will necessarily be a much more active field than the search for ways of using lower-grade coals.

In 1954 the gas industry used about 540,000 tons of heavy oil and gas oil compared with about 27,500,000 tons of coal and 1,500,000 tons of coke. This puts the matter in perspective, and emphasises the fact that whatever oil may be used in the gas industry, coal must continue to supply the overwhelming majority of the industry's needs.

TABLE 1.—WORLD PRODUCTION AND CONSUMPTION OF OIL AND OIL PRODUCTS, 1954

	Production		*Consumption*	
	1,000 *Barrels*	*per cent.*	1,000 *Barrels*	*per cent.*
N. America	2,496,066	50.0	2,737,702	60.9
S. America and Caribbean	810,368	16.2	256,161	5.7
W. Europe	30,110	0.6	644,159	14.3
E. Europe and U.S.S.R. ...	508,800	10.2	467,000*	10.4
Middle East ...	1,013,545	20.3	61,144	1.4
Asia (except as above)	10,617	0.21	144,230	3.2
Africa	1,451	0.03	93,833	2.1
Australasia, etc. ...	119,854	2.4	87,263	1.9
Total	4,990,811	100	4,491,492	100
U.K.	450	0.01	180,810	4.1

* Assumed.

From: J. V. Hightower and H. J. Barton—World Petroleum Statistics, U.S.B.M., WPS No. 79.

Oil Supplies

It is of interest to consider next where our oil supplies come from and what products are likely to be offered to the gas industry. Table 1 shows the figures for world production of crude oil and for the consumption of major refinery products for 1954.

While North America is still by far the largest producer and consumer of oil, the Middle East oilfields have a greater total of discovered oil than North America. The total of production to date plus proved reserves at January 1, 1955, was 99,000 mill. barrels in the Middle East and 88,000 mill. barrels in North America. The proved reserves of North America, however, are only about a third of those of the Middle East. Since North America is a net importer of oil it follows that the Middle East will be our main source of oil products in the future.

TABLE 2.—IMPORTS OF CRUDE OIL AND FINISHED PRODUCTS INTO EUROPE, MILL. METRIC TONS (O.E.E.C. REPORT).

Source	1938	1950	1955
Middle East	8	40	90
Western Hemisphere ...	26	16	21
Others	5	—	2

That this is what is actually happening is emphasised by Table 2 which shows that oil imports into Europe from the Middle East have more than doubled during the last five years, while those from North America have remained relatively steady.

Natural Gas

Natural gas is another naturally occurring raw material which is playing an important part in certain parts of Europe, particularly in Italy. As such this is not likely to be a material of great interest in this country although small quantities of methane from mine drainage schemes are being reformed. Production of natural gas in a number of countries is shown in Table 3.

TABLE 3.—PRODUCTION OF NATURAL GAS IN SOME EUROPEAN COUNTRIES AND THE U.S.A. (*O.E.E.C.* REPORT)—MILL. OF CU. FT. HAVING BETWEEN 890 AND 995 B.Th.U. PER CU. FT.

Country	1948	1953	1954
Austria	3,290	10,500	—
Czechoslovakia ...	—	6,060	—
France	6,600	9,550	9,810
Italy	4,390	8,700	112,800
Holland	—	76	2,690
Poland	—	—	18,940
Rumania	—	—	216,000
U.S.S.R.	—	—	265,000
Western Germany ...	2,850	6,440	5,680
Jugoslavia	340	2,760	3,410
U.S.A.	3,105,000	5,490,000	5,970,000

There are gas-making processes which can handle any of the products of the oil refineries; some processes are more selective in this respect than others. A few years ago most effort was being directed towards finding means of gasifying heavy fuel oils and this at present prices is still an attractive proposition, but the refineries have been finding it increasingly difficult to supply the market with their various products in the proportions demanded. In effect, the consumption of the middle fractions such as gas and diesel oil, together with that of fuel oils, has increased faster than the demand for motor spirit. This has been something of an embarrassment to the oil companies who have for some time been offering light distillate to the gas boards for gasification. This material varies somewhat in composition but often corresponds roughly to hexane. In addition to this supplies of refinery gas and liquid petroleum gases such as propane and butane are available. The ideal process is obviously one which is sufficiently flexible to handle the product which is offered at any time at the most advantageous terms.

The chemical nature of the oil used is of course very impor-

* Reproduced by courtesy of the Journal of the Institute of Fuel.

tant, particularly in processes involving thermal cracking, and some thermal cracking is difficult or impossible to avoid in any process with the heavier and more easily decomposed oils. For the production of gas it is well known that paraffinic base oils are most suitable; aromatic base oils being the least suitable since aromatic compounds tend to polymerise on cracking and form tars. Crude oils are generally classified as of paraffinic, naphthenic, asphaltic, aromatic or mixed base. This is a very broad empirical classification and the oils from one locality can vary quite considerably, especially if they come from strata of different geological age. The younger crudes tend to be more asphaltic and to have a higher sulphur content, and the deeper formations to be more paraffinic.

Pennsylvanian oil is the classic paraffinic base oil, while some of the most aromatic oils are produced in Rumania and the Far East. As mentioned earlier, however, it is the Middle Eastern oils which are likely to interest us most in this country and these are generally described as being of mixed base, moderately paraffinic and of high sulphur content.

Oil Cracking

The hydrocarbons which it is desired to use for the manufacture of town gas may vary from the very simplest of almost pure hydrocarbons such as methane which is the main constituent of natural gas and mine gas, to the very complex compounds present in heavy oils. They all have in common the fact that their C/H ratios are higher than that of the town gas which it is desired to produce. If by straightforward thermal cracking a gas such as town gas is to be produced it is obvious that a residue of carbon and/or tar of higher carbon content than the original feed must also appear. Apart from the fact that such a gas would not necessarily have the desired composition, this process is wasteful and would require much of the fuel to be cracked to the ultimate limit, i.e., to carbon and hydrogen.

Consequently, in all processes designed to produce a town gas as normally distributed in this country, the aim is in effect to reduce the C/H ratio of the feed by causing the hydrocarbon to react with steam and/or hydrogen. In short, the object is to crack the material in a way which produces the maximum yield of gaseous products and since these are of relatively high hydrogen content this is achieved by making the feed react with hydrogen in one form or another.

When hydrocarbon oils are cracked simply by being subjected to heat, various types of reaction occur. The lower paraffins tend to lose hydrogen with a consequent tendency to deposit carbon. The higher paraffins tend to split into a smaller paraffin and an olefine. The olefines split further in a similar way, yielding a diolefine and a paraffin with the result that relatively large quantities of ethylene, the lowest and most stable olefine, are formed. This only decomposes further at very high temperatures, but can enter into dehydrogenation and polymerisation reactions.

Naphthenes tend to undergo dehydrogenation reactions which convert them to aromatic compounds or intermediate unsaturated ring compounds which decompose to olefines and compounds such as butadiene.

Aromatic compounds are notoriously the least useful for cracking to gaseous products, since at lower temperatures they tend to lose hydrogen and form multiple ring aromatic compounds or coke. They are therefore more responsible than other compounds for tar formation.

This sort of cracking is most nearly approximated to in high B.Th.U. oil gas plants where the steam admitted with the oil plays little part in the reaction. In fact, the CO content of high B.Th.U. oil gas is generally only of the order of 2%. Catalysts can be used in straight thermal cracking reactions to influence the course of the reaction in such a way as to produce more gaseous products by altering the position in the chain at which cracking occurs. In addition the reaction rates can be speeded up.

When cracking in the presence of steam there is superimposed on the purely thermal cracking reactions the reaction between steam and the decomposing hydrocarbons leading to the production of carbon monoxide and hydrogen. It is this sort of process which can produce directly a gas similar to town gas. When carried out without a catalyst it is necessary to use temperatures which produce carbon black and no tar and this is what occurs in the Jones process. In the Segas and Onia-Gegi processes these reactions are catalysed and can be carried out at temperatures such that when using materials such as heavy fuel oil, a certain amount of tar is formed.

The main difference between these last two processes lies in the nature of the catalyst, the former using a lime/magnesite catalyst and the latter a nickel catalyst. An important difference between the catalytic actions is that under the cyclic conditions of operation the nickel catalyst actually enters into the reactions at the beginning of each phase and is oxidised or reduced, whereas the lime/magnesite catalyst is not.

Although steam is probably the most convenient source of hydrogen to use to reduce the effective C/H ratio of the feedstock, the use of hydrogen itself must not be ignored. It is well known that in thermal cracking processes the gaseous yield is improved if the reactions take place in an atmosphere of hydrogen. This type of cracking occurs to some extent in carburetted water gas plant.

The hydrogenation reactions have been studied by Dr. Dent, who has carried out work on both coal and liquid hydrocarbons under pressure, for the production of methane. These reactions have the advantage of making it easier to obtain a gaseous yield from the aromatic hydrocarbons. Such a process, working under pressure has obvious advantages where the gas needs to be distributed over long distances.

A further type of reaction which can be used for oil gasification is the use of air or oxygen for partial combustion. When air is used, the nitrogen content of the gas normally makes it unsuitable for distribution as normal town gas. Where the scale of operation justifies the use of oxygen, however, this type of process can be considered. These general remarks on cracking reactions have involved some over-generalisation inevitable in any attempt to condense such a wide subject into a small space.

Gas-Making Processes

It is proposed now to consider more specifically how the various cracking reactions are used in commercial processes. There has been a very great expansion of interest in this subject since the war, particularly in this country and on the Continent, and this has resulted in the appearance of a number of new processes. No attempt will therefore be made to describe all the known processes. This paper will be limited to a general description of the processes available with certain of them treated in more detail.

Straight thermal cracking of oil to make town gas began at the beginning of the century in the Pacific Coast area of America at a time of abundant oil supplies and high coal prices. For this purpose crudes or topped crudes were used to make a gas by thermal cracking having about 500-600 B.Th.U. per cu.ft. This type of process was improved on as efficiency became an important consideration and culminated in various forms of the Jones process.

More recently the need has been to produce a gas of about 1,000 B.Th.U. per cu.ft. from lower-grade residual oils, to supplement natural gas supplies. An important consideration in the evolution of many of these processes has been the ability to convert water gas or other plant to the process. Many such plants have been so converted in America to safeguard against the possible failure of natural gas supplies and some have hardly ever had to be used. Under such conditions it is natural that the emphasis is on a cheap conversion rather than on one which will produce gas at high efficiency.

In Europe before the last war oil was a relatively expensive fuel, and the incentive to use it for gas-making was not great except for peak load purposes. Since the war the relative costs of coal and oil have so moved that in many parts of this country—particularly in the south where gasmaking coal prices are high, oil is probably now the cheapest fuel for gas-making. The need in this country and in Europe generally, however, is for a gas of 450-500 B.Th.U. per cu.ft. and it is towards that end that efforts have been directed in the last few years.

Thermal Cracking with Steam

The principal process that falls into this category is the Jones process which has been established for a very long time and has existed in a number of different forms. In it, the oil and steam are cracked on chequers at temperatures sufficiently high to produce a gas having a C.V. similar to town gas or lower. This results in the formation of carbon black. In one

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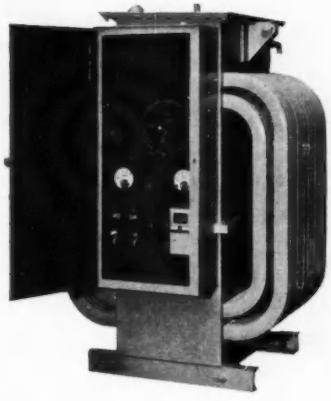

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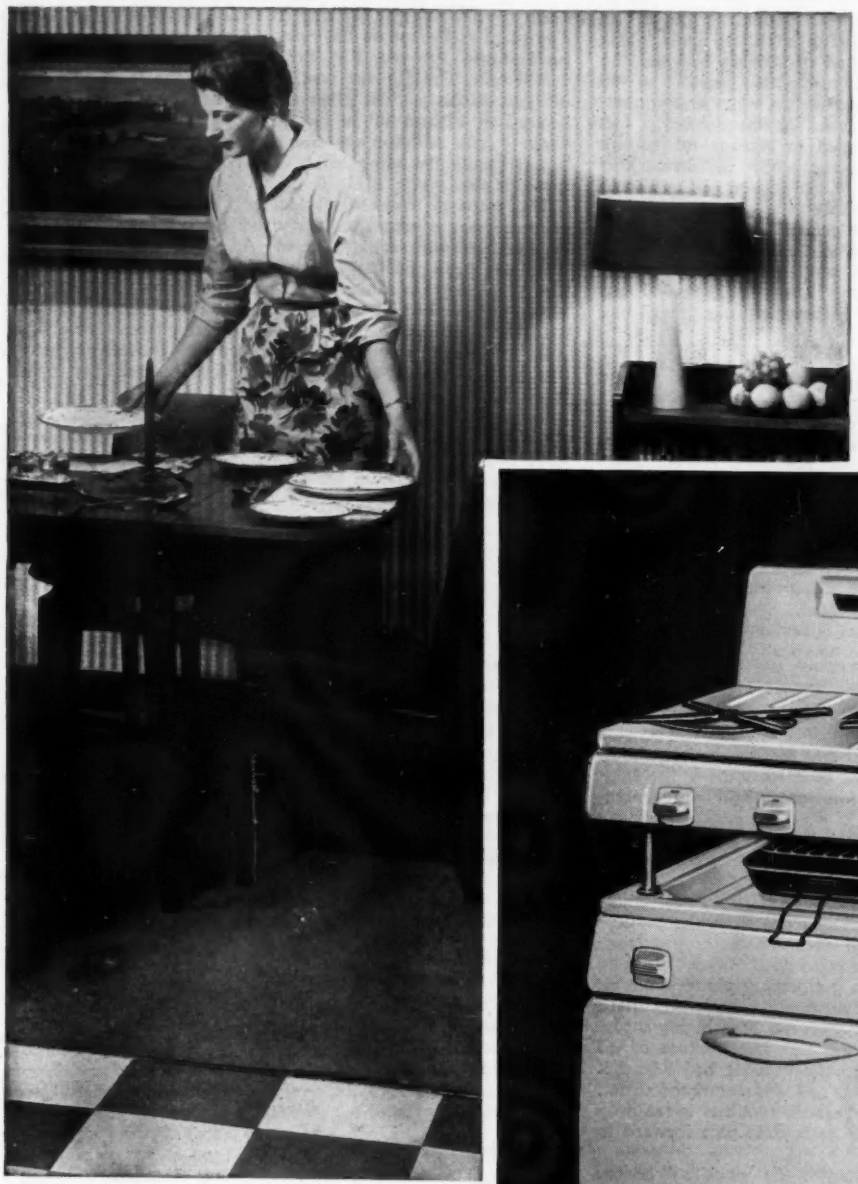

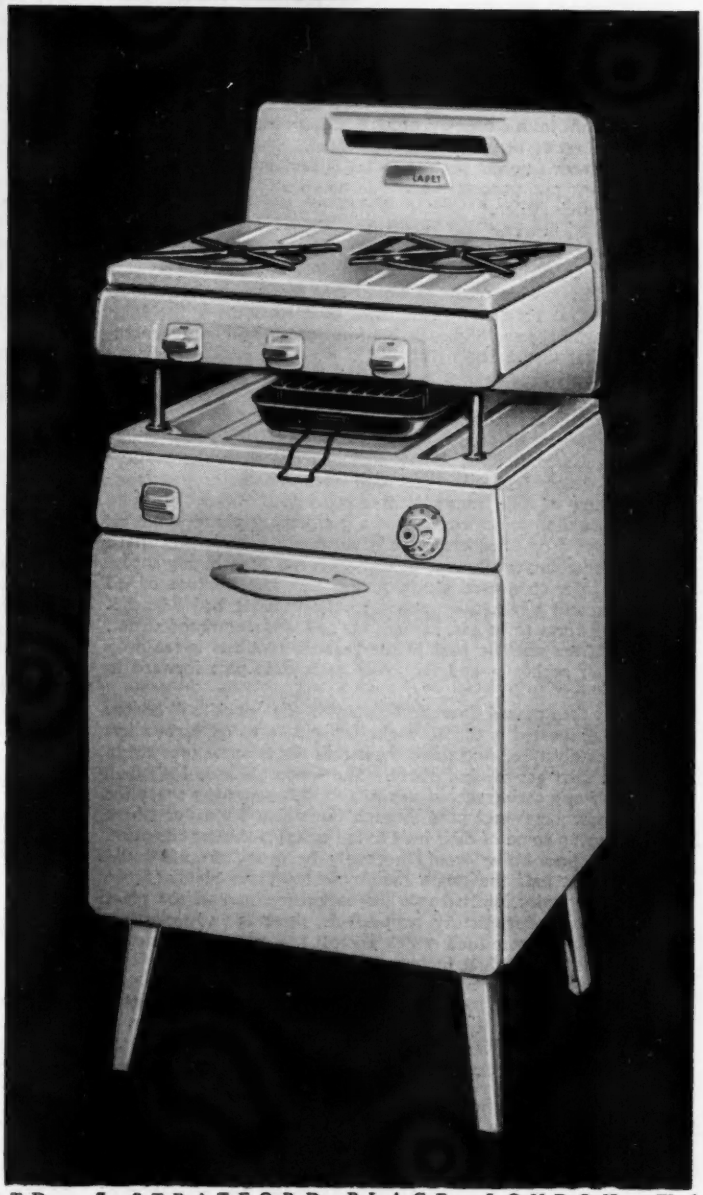

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form, popular at one time in America, much of the carbon black was tapped in vessels containing refractory balls. This carbon was then used as a fuel bed to provide heat for the process and to generate blue water gas. Other versions of the plant collected the carbon from the washbox water and briquetted it with tar for use as boiler fuel. In this country a few plants have been specially developed to recover the carbon black dry in a form acceptable to the rubber industry. This materially improves the economy of the process but, although further units are being built, is unlikely to be generally adopted because of the limited market for carbon black.

The Sixth Report and Accounts of the Gas Council (1954-1955) records that a pilot plant of 1 mill. cu.ft. per day capacity is being built to develop a non-catalytic oil gas process involving the inter-action between petroleum oils and highly superheated steam.

Catalytic Cracking with Steam

Processes of this type fall into two main classes, cyclic and continuous. The two cyclic processes which have established themselves in this country in the last few years are the Onia-Gegi and the Segas processes. The former was developed in France by Office National Industriel de l'Azote in co-operation with Gaz de France and uses a nickel catalyst. It has been developed further in this country in the West Midlands Gas Board along lines which make it more suitable for handling the residual oils in this country which are more highly cracked than those generally in use on the Continent. The use of a nickel catalyst with sulphur containing oil is facilitated by the cyclic nature of the process which automatically regenerates the catalyst each cycle.

There is, however, the disadvantage that as the nickel itself is oxidised and reduced each cycle there is a production of gas of high CO_2 content at the beginning of each run. The process can handle a wide range of liquid and gaseous hydrocarbons. Two general forms of plant have been developed, the non-regenerative type as originally built in France, and the regenerative similar to the Segas plant.

The Segas process uses a magnesite/lime catalyst which itself plays no part in the gasification reactions. The process was first developed in the laboratories of the South Eastern Gas Board with the object of producing from heavy fuel oil a gas similar to town gas, and although now well established for the gasification of heavy fuel oil it has also been satisfactorily demonstrated on a wide range of hydrocarbons. When gasifying heavy oil the process consists of a gas-making phase where oil is vaporised on chequers or in a chequerless vaporising space in a countercurrent flow of steam which has been highly superheated in a chequered steam preheater. The mixture of oil vapours and steam then passes to the catalyst bed where it reacts to form town gas, carbon, tar and undecomposed steam. Some of the sensible heat in the gaseous products is removed in the air preheater and the make gases then pass forward to the washbox.

Air is then passed through the plant in the opposite direction. This is preheated in the air preheater and burns off carbon left in the catalyst bed and thereby restores the temperatures ready for the next gas-making phase. The waste gases and air then burn off any carbonaceous deposits in the vaporising space (or in the chequers) and pass through the steam preheater where they give up some of their heat to the steam preheater chequers. A waste heat boiler would normally be provided and would raise about half the steam requirements of the plant. Some fuel is normally injected into the vaporising part of the plant to produce a satisfactory temperature there for vaporisation. When using lighter fuels which deposit less carbon it is necessary to use extra fuel in burners elsewhere.

Commercial plants to operate the process have been designed by the Power-Gas Corporation in co-operation with the South Eastern Gas Board. Three plants of this type have been put to work, one at Sydenham (S.E.G.B.), one at York (N.E.G.B.), and one in Germany at Hameln. Others are being built.

The first two of these were the prototype commercial units designed in three vessels, the oil being vaporised by spraying on to the chequers of the steam preheater. The plant at Hameln is of later design, the steam preheater and a vaporising chamber forming one vessel and the catalyst bed and air preheater being incorporated in the other.

All have a nominal capacity of 1 mill. cu.ft. of gas per day. The plant at Sydenham has operated on a number of different fuels—heavy fuel oil, B.P. Britoleum, gas oil, light distillate and butane, and for the past year or so has been operating on light distillate. The plant at York has always operated on heavy fuel oil and has in fact now operated as base load for about a year without any change being made in the catalyst bed, virtually the same batch of catalyst having been in use for over two years.

The plant at Hameln started working early in 1956. In general it has operated on heavy fuel oil, but for a time crude oil was used with equal success. An interesting development there has been the use in tests of brown coal tar obtained from the low-temperature carbonisation of brown coal. There are large reservoirs of this material in Eastern Germany. It is a highly paraffinic tar, and as will be seen from Table 4, it gave results which compare favourably with those from heavy fuel oil, and a plant is to be built in Eastern Germany to use this fuel.

Table 4 shows typical operating data for Segas plant using various feedstocks, and Table 5 shows the characteristics of some of the feedstocks used.

The calorific value of the gas produced in a Segas plant is determined principally by the temperature of the catalyst.

TABLE 4.—SEGAS PROCESS—TYPICAL OPERATING DATA
(BASIS: 1,000 CU.FT. OF GAS)

Oil	*Heavy Fuel (950 sec.)*	*Gas Oil*	*Light Distillate*	*Brown Coal Tar*
Process oil, gal.	3.91	3.60	4.32	3.37
Heating oil, gal.	0.18	0.20	0.40	0.32
Steam: oil ratio	0.95	0.93	0.64	—
Process and purge steam, lb.	55.0	47.7	35.3	70.0
Air used, cu.ft.	3,250	3,170	2,320	2,760
Gas analysis:				
CO_2	9.2	5.8	3.0	12.8
O_2	0.5	0.4	0.8	0.3
CnHm	6.6	4.2	5.1	5.1
CO	14.8	8.3	15.1	16.3
H_2	49.1	50.3	57.6	46.4
CH_4	15.6	16.2	14.7	14.7
N_2	4.2	4.8	3.7	4.4
C.V. B.Th.U. per cu.ft. ...	500	492	490	481
Sp. Gr. (air = 1) ...	0.56	0.52	0.40	0.57
W.H. steam raisable, lb. ...	39.5	29.0	36.3	N.K.
Tar produced, gal. ...	0.46	0.20	—	N.K.

TABLE 5.—SEGAS PROCESS—TYPICAL ANALYSIS OF FUELS USED

Fuel	*Heavy Fuel Oil*	*Gas Oil*	*Light Distillate*	*Brown Coal Tar*
Sp. Gr. 60°F./60°F. ...	0.955	0.850	0.654	0.951
Viscosity, sec. Red No. 1 at 100°F.	812	—	—	230
Conradson carbon, % ...	10.4	nil	nil	4.32
Ash content, %	0.029	—	0.01	0.126
Ultimate analysis, %:				
C	85.0	85.1	83.4	—
H	11.0	13.2	16.5	—
S	3.7	0.5	0.02	—
C.V. therms./gal. (gross)	1.79	1.67	1.35	1.72 (approx.)

The control of this when operating on heavy oil is achieved by burning the carbon deposited in the catalyst bed with sufficient excess air to restore the catalyst bed temperatures to the same level at the end of each blow. With light feedstocks where less carbon is deposited the control has to be by the addition of heat. It will be appreciated therefore that the quantity and physical condition of catalyst in the catalyst bed play an important part in the operation of the plant since these have an important bearing on the amount of carbon released by the cracking reactions and the proportion of that carbon retained in the catalyst bed. These in turn affect tar quality,

TABLE 6.—HERCULES PLANT FOR TOWN GAS MANUFACTURE—TYPICAL PERFORMANCE DATA (QUANTITIES PER 1,000 CU. FT. OF MIXED GAS OF 500 B.TH.U. PER CU. FT.)

Feed Gas / Analysis % by vol.	Natural Gas Feed	Natural Gas Cracked	Natural Gas Mixed	Refinery Gas Feed	Refinery Gas Cracked	Refinery Gas Mixed	Propane Feed	Propane Cracked	Propane Mixed
CO_2	0·4	4·2	2·8	—	11·3	9·3	—	9·0	8·2
O_2	0·1	—	—	—	—	—	—	—	—
CO	—	19·4	12·7	—	14·2	11·7	—	18·4	16·7
H_2	—	73·5	48·2	5·0	74·2	61·9	—	72·1	65·2
CH_4	87·0	0·5	30·4	40·0	0·3	7·3	—	0·5	0·5
C_2H_4	—	—	—	10·0	—	1·8	—	—	—
C_2H_6	2·6	—	0·9	25·0	—	4·4	—	—	—
C_3H_6	—	—	—	10·0	—	1·8	10·0	—	0·9
C_3H_8	0·6	—	0·2	9·0	—	1·6	90·0	—	8·5
C_4H_8	—	—	—	—	—	—	—	—	—
C_4H_{10}	0·1	—	—	1·0	—	0·2	—	—	—
N_2	9·2	2·4	4·8	—	—	—	—	—	—
Gross C.V. B.Th.U. per cu. ft.	930	300	500	1,487	285	500	2,460	293	500
Density : Air = 1	0·62	0·33	0·45	0·81	0·36	0·44	1·51	0·37	0·47
Volumes cu. ft.	167	654	1,000	124	823	1,000	84·8	906	1,000
Heating gas cu. ft.		114			89			52	
Efficiency, % :									
(*a*) of cracking		74			74			79	
(*b*) overall		86			86			88	
Steam lb. per 1,000 cu. ft.		13·0			36·8			30·4	
Consumed for process :									
Made in make waste heat boiler		14·6			26·2			23·9	
Made in furnace		—			11·3			7·0	

and, by the effect they have on air requirements, the distribution of heat throughout the plant.

With a reasonable balance between the various factors involved the process operates to produce a gas of low naphthalene content and a fluid tar. Incorrect operation can lead to overcracking and the production of a tar of high viscosity due to the presence of carbon and naphthalene.

Typical of the catalytic processes which operate continuously is the Hercules process developed by the Hercules Powder Company in America. This uses a nickel catalyst in externally-heated, heat-resisting steel tubes. It is primarily designed to operate on light liquid or gaseous feedstocks, and while of little interest to the gas industry in this country until recently, it is now assuming greater importance because of the availability of increasing quantities of refinery gas and light products from the oil refineries.

Steam can be recovered from waste heat boilers at either end of the plant. This type of process has the advantage when dealing with a gaseous material that the feedstock can be cracked in the tube to a very low C.V.—say around 300 B.Th.U. per cu.ft. and this can then be cold enriched. As the cold enriching is carried out with 100% efficiency, a higher overall efficiency always results.

Table 6 shows some typical performance data for a Hercules plant making town gas from three different feedstocks.

It will be observed that a high overall efficiency is obtained, and the plant is self-supporting in steam.

When producing town gas from a liquid feedstock, such as light distillate (or light gasworks feedstock as it is sometimes called), the catalytic tubes may be associated with one or more thermal cracking tubes producing a gas of about 1,500 B.Th.U. per cu.ft. which can be used to enrich the gas leaving the catalytic tubes.

Thermal Cracking to Produce High B.Th.U. Oil Gas

The production of gas of around 1,000 B.Th.U. may not at first sight appear to come within the scope of a paper on the subject of town gas production. However, since (as will be mentioned later) this type of process can be used in combination with other processes, its inclusion seems justified.

Much ingenuity has been expended in devising ways of converting C.W.G. plants to this type of process. Of the plants specifically designed for producing this sort of gas the Hall process, developed by E. L. Hall of the Gas Production Research Committee of the American Gas Association, and the Semet-Solvay process developed by the Semet-Solvay Corporation in America, are probably the best known.

They differ in the manner in which the oil is vaporised and cracked, the Hall process vaporising the oil on to chequers concurrently with a flow of steam, while the Semet-Solvay process vaporises the oil countercurrent with the steam in the well-known Semet-Solvay chequerless vaporiser. The steam itself plays little part in the reaction, acting principally as a carrier gas.

The range of calorific value obtainable with such plants is limited, generally being 1,100-1,300 B.Th. U. per cu.ft. If too low a temperature is used for cracking to produce a gas of high calorific value, the production of gas is small and of liquid products excessive, while attempts to make gas of too low a calorific value result in over-cracking and excessive carbon production with a consequently viscous tar. To obtain a gas of 1,000 B.Th.U. per cu.ft. it is usual to mix blow gases in with the make gas to dilute it. Typical results from a complete gasification plant, converted in Rome to a high B.Th.U. oil gas plant by the Power-Gas Corporation, Ltd., are shown in Table 7.

Partial Combustion Processes

Processes of this type, such as the Dayton G.E.I.M., and Gas Light and Coke processes, operating at atmospheric pressure and using air for combustion have not been generally adopted because of their dependence on the use of the better quality distillate fuels such as gas oil, and because the gas produced has a high specific gravity owing to its high nitrogen content, and this makes it unsuitable for general distribution with normal town gas.

With the tendency at the present time for gas to be produced in smaller numbers of large units, consideration can be given in large schemes to processes which use oxygen. One such process recently developed is the Texaco process, which while not producing town gas directly can be used in conjunction with other processes. Primarily intended as a means of producing synthesis gas, this process operates at pressures of 100-500 lb. per sq. in., gauge. Water is vaporised in one heater and the steam so produced mixes with the oil and passes through a second heater. From there, the mixture at 700-800°F. mixes with preheated oxygen in an atomiser situated at the top of the generator. The resultant gas is quenched and later washed with water. A small amount of carbon slurry is produced.

The process can use a wide range of feedstocks from methane to heavy fuel oil and coal tar, and is obviously one which has advantages where long-distance transmission of the gas is involved.

Some of the processes described above do not in themselves

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TABLE 7.—ROME RESULTS.

Date : March, 1955	19/20	20/21	21/22	22/23	23/24	24/25	25/26	26/27
Day's run : h. min.	22–15	21–15	22–45	22–45	22–15	23–15	22–40	22–40
Gas made : cu. ft. per hour	50,500	50,800	48,900	48,500	51,500	50,600	52,000	51,400
Calorific value B.Th.U. per cu. ft.	1,219	1,170	1,215	1,198	1,152	1,172	1,192	1,182
Therms made per hour	615	595	595	580	594	595	620	607
Make oil used per hour (gal.)	584	584	590	583	590	591	596	594
Burner oil used per hour (gal.)	62	66	61	61	61	63	61	60
Total oil used per hour (gal.)	646	650	651	644	651	654	657	654
Therms per gal. make oil	1·050	1·020	1·010	1·011	1·010	1·008	1·040	1·020
Total oil	0·950	0·915	0·915	0·916	0·915	0·910	0·945	0·930
Temperatures, max. and min., during cycle ° C. Fixer top	780/940	780/940	790/950	780/950	780/940	790/920	780/910	790/910
Fixer base	750/820	820/890	760/830	760/820	760/830	750/820	750/820	750/820
Steam consumption per therm (lb.) : Process	3·44	2·98	3·44	3·44	3·44	3·44	3·44	3·44
Purging	4·46	4·06	4·06	4·06	3·44	3·44	3·44	3·44
Total	7·90	7·04	7·50	7·50	6·88	6·88	6·88	6·88
Equivalent steam per 1,000 cu. ft. of 1,000 B.Th.U gas (lb.) total	79	70·4	75	75	68·8	68·8	68·8	68·8
Efficiency gas per make oil, %	59·5	57·5	56·8	56·4	56·8	56·9	58·6	57·6
Gas per total oil, %	53·75	51·77	51.56	51.01	51.50	51.44	53.22	52.26

produce town gas but can be used, particularly on large schemes, in conjunction with other processes. The outstanding example of such a combination of processes is of course carburetted water gas, and although this process has generally been used in its classical form to produce a mixture of blue water gas and high B.Th.U. oil gas from the thermal cracking of gas oil, the scope can be extended to the use of both heavier and lighter feedstocks than gas oil.

The use of heavy fuel oils for carburetting is one way of extending the scope of C.W.G. practice which has received attention on both sides of the Atlantic. The peculiar difficulty with heavy oils is of course that they decompose well before they can be completely vaporised with the result that they leave carbonaceous deposits.

This problem has been overcome in a number of ways. Some of the oil can be injected into the fuel bed during the uprun and the carbon deposited there is eventually consumed with the coke. Alternatively, the carburetter can be specially designed to cater for this type of oil as is the case with the Semet-Solvay type of ignition dome and reverse flow chequerless carburetters. Any deposits not burnt off cyclically have to be removed by hand, and consequently a good deal of thought has been given to the removal of these deposits cyclically. The means employed include arrangements for the introduction of additional air at important points and manipulation of the operating cycle and rates.

However this is achieved, more air is required and in a plant not specifically designed for this there may be some consequent loss of output. Compensatory factors are a reduction in carbon consumption in the generator and an increase in waste heat boiler steam production.

The lighter hydrocarbons can be reformed in the generator. The feedstock such as refinery gas, propane, etc., is admitted to the generator on the uprun and/or backrun. The particular advantage of using hydro-carbons in this way is that when reforming to the greatest possible extent steam consumption per 1,000 cu.ft. of final gas can be roughly halved and carbon consumption can also be reduced to a very low level. Many variations on this theme are possible. It is possible for example to produce a gas of low specfic gravity with which blow/run gases can be mixed, and to cold enrich the final mixture with the hydrocarbon feedstock.

Table 8 shows figures for this type of operation. Reforming can also be combined with carburetting.

TABLE 8.—REFORMING OF REFINERY GAS IN C.W.G. PLANT (MAXIMUM REFORMING) (CARROLL AND PAQUETTE—REVIEW OF REFORMING OF HYDROCARBONS IN WATER GAS SETS)

	R.O.G.H₂S Free %	*Reformed Gas* %	*With blow run* %	*With blow run and cold enrichment* %
CO_2 ...	0.7	2.4	6.6	5.6
O_2 ...	0.7	0.4	0.3	0.6
CO ...	1.7	15.0	16.9	12.6
H_2 ...	5.3	55.6	34.8	31.7
CH_4 ...	26.0	20.8	13.8	10.1
C_2H_6 ...	19.4	—	—	10.9
C_3H_8 ...	17.8	—	—	—
C_4+ ...	5.0	—	—	—
Ill. (C_2H_4) ...	21.4	4.1	2.5	4.2
N_2 ...	2.0	1.7	25.2	24.3
Sp. Gr. ...	1.02	0.40	0.64	0.70
C.V. ...	1,734	532	361	521
W.I. ...	1,710	843	451	624

A number of possibilities exists for combining other distinct processes. Some of these may not be attractive under present conditions but are nevertheless possibilities. One such combination recently put into effect in Australia is the production by a private firm (Petroleum and Chemical Corporation (Australia), Ltd.), of high B.Th.U. oil gas by the Semet-Solvay process in a plant designed and built by the Power-Gas Corporation, Ltd. The gas is purified and washed for benzole under pressure and sold to the Australian Gas Light Company for mixing with other gases of low C.V. The gas is produced in the Semet-Solvay plant at a calorific value of about 1,250 B.Th.U. per cu.ft. and delivered to the gasworks at about 1,100 B.Th.U. per cu.ft. Production is at a rate of 12½ mill. cu.ft. per day in two units with a third unit installed as standby. The recovery of light oils and tar is an important feature of this scheme.

Corrosion—and the advantages of

Zinc Protective Anodes

ZINC was first deliberately used for cathodic protection at the start of the 19th century when zinc blocks were fitted to the hulls of ships of the Royal Navy to protect the copper sheathing. Since 1930 the technique has found other applications, particularly for giving additional protection to coated pipes and other structures buried in soil.

Corrosion is electrochemical in nature; that is, an electric current flows through an electrolyte between two parts of a metal which are at different potentials. The anodic part tends to dissolve while hydrogen is formed at the cathode. The necessary difference in potential can occur in a number of ways; among the more common causes are lack of homogeneity in the metal, foreign inclusions, differences of grain orientation, and differences of environment. Different metals which are in electrical contact will also form such a system, and the importance of good insulation in such cases cannot be overemphasised. Nearly all media in which metals are commonly immersed will act as electrolytes, the most usual being, of course, air, water and earth.

Cathodic protection is accorded by superimposing on the metal or metals a potential greater than that causing corrosion, and making the whole of the surface to be protected cathodic with respect to an external anode in the same environment. The necessary potential difference is usually of the order of one volt, though the requirement varies with the properties of the metals and of the surrounding medium.

Zinc is an appropriate metal to use for the external anode referred to by virtue of its position in the electrochemical series; it is more active than all the common metals with the exception of aluminium and magnesium and thus when it is in electrical contact with, for example, steel, in the presence of an electrolyte the zinc is dissolved leaving the steel uncorroded. This property of zinc has led to its wide use in the fight against corrosion, both as a protective coating and in the form of block anodes.

Simple to Install

In the first case, it forms a continuous layer over the steel surface which, even when it is pierced in any way, continues to protect the basis metal in the sacrificial manner described, so that the steel does not start to corrode until a large proportion of the zinc has been eaten away. This way of utilising the properties of zinc, though extremely effective, is not entirely appropriate where the work to be protected is not readily accessible for repair and maintenance servicing: It is in such circumstances that zinc anodes are so useful for they are not large and can be replaced without disturbing the steelwork which they protect. The diagram (Fig. 1) shows three standard zinc anodes, and it is evident that they are simple to install, repair and replace.

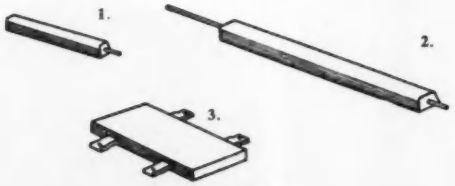

Fig. 1. Three standard zinc anodes: (1) **Top, left**—*used for oil, gas and water pipe lines, with a core of ¼ in. round galvanised steel protruding 2 in. from one end. (2)* **Top, right**—*used for grounding electrodes for power stations, cables, oil storage tanks and transmission line towers. (3)* **Below**—*used for steel structures in sea water.*

When zinc anodes were first used, they were sometimes found to give disappointing service, and this was in many cases due to their being made from the wrong grade of zinc. It has only recently been realised how important the purity of metal is in this application; on all but the purest anode a thick layer of corrosion products is soon built up and this will entirely stifle further electrochemical action. Iron in particular was found to be very harmful if present in proportions greater than 14 p.p.m., though it has also been found that by adding 0.5% aluminium and 0.5% silicon to the zinc, the undesirable effects of up to 200 p.p.m. of iron can be eliminated. In America, cadmium is used as an alloying metal and it has been found that 0.1% aluminium and 0.5% cadmium give the same current output over the whole range of iron contents tested.

The natural rival for zinc as a protective anode material is magnesium, but in fact there are a number of considerations which make it possible, in most cases, to decide fairly easily between the two materials. Aluminium, the other obvious possibility, has not been found to be very satisfactory for a number of reasons. The position of magnesium below zinc in the electrochemical series means that it has a higher driving potential; that is, it can be used to advantage in electrolytes which have too high a resistance for zinc to be effective in them. On the other hand, if used in a medium of low electrical resistance, a magnesium anode will be eaten away more quickly than a zinc one would be, and this, quite apart from its higher cost, makes its use uneconomical in such circumstances. The lower potential of zinc usually eliminates any danger of hydrogen forming on the protected structure, and the likelihood of stripping paint or of causing explosions in confined spaces is thus reduced. Similarly, the electrical resistance of a circuit containing a zinc anode is fairly low and therefore less affected by changes in conditions.

The quantity of electricity produced by a given weight of metal can be calculated from its electrochemical equivalent, the values for zinc and magnesium being 372 and 1,000 ampere hours per lb. respectively. In practice, however, the amounts are always lower and while zinc usually gives more than 90% of the theoretical value, magnesium gives only 50%, much of its energy being dissipated by self-corrosion. The amounts actually obtained from zinc and magnesium are therefore 335 and 500 ampere hours per lb. respectively (see Table 1). Since 1 lb. of zinc is much cheaper than 1 lb. of magnesium, the material cost of protection with zinc is appreciably lower.

TABLE 1.

	Zinc	Magnesium
Electro-chemical equivalent grams per coulomb	3.39×10^{-4}	$1.26 \times 10^{-}$
Theoretical amp. hr. per. lb.	370	1,000
Efficiency	90%	50%
Actual amp. hr. per lb.	335	500
Actual amp. hr. cu. ft.	445	120
Soln potential against $CuSO_4$	−1.1	−1.55

Cathodic protection for pipelines, although not the oldest use for zinc anodes, is now the most extensive. However, there is an alternative method of ensuring protection for articles buried in the ground, and this should be mentioned, in order to bring out the characteristic advantages of zinc anodes for this purpose. As stated earlier, the basic principle of cathodic protection is that of impressing a potential difference between the actual surface and an external electrode, which will overcome the small voltages on the metal itself that tend to cause corrosion. Using a zinc or magnesium anode, this can be done by forming a galvanic cell. However, it is possible to get the required voltage from an external source such as a battery or a rectifier.

As in the choice between zinc and magnesuim anodes, the decision whether to use anodes or an external source of power is governed by several factors. Chief among these are the economic considerations of installation and upkeep and the purely functional one of current requirement. The cost of installing a rectifier system per ampère of current produced is favourable, but the maintenance costs are likely to be high for, as well as routine servicing, such as installation is always

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liable to need repair due to damage caused by natural phenomena, *e.g.*, lightning and storms. A zinc anode system, on the other hand, needs no maintenance until it has to be replaced.

The performance required from a cathodic protection service is even more limiting: The galvanic anode can only supply comparatively small currents at low potentials, whereas larger currents can always be obtained from an appropriate rectifier. The critical current value, above which it probably pays to use an external source of power, is in the region of one ampère, although the expected life of the installation will also obviously come into the calculation.

Since 1935, cathodic protection by means of zinc anodes has been successfully applied to a large number of underground systems. It is most effective for new installations when used in conjunction with a good protective coating because the anodes have then only to protect this coating at first, until in the course of time parts of it are corroded away; thus much less current is used initially, and the life of the anodes is considerably increased. It should be obvious that the anodes themselves must not be coated, or they will not be able to function, but this has not always been appreciated. Old pipelines have also been protected in this way with great success, the most outstanding example of this being the gas mains at Houston, Texas. From 1931 to 1944, there were a total of 142 leaks. In 1944, zinc anodes were installed on the whole system and in the next eight years only six new leaks appeared.

It has been found that, in order to preserve the activity of the zinc in earth, it is sometimes necessary to surround each anode by a 'backfill' of gypsum and bentonite. This renders the layer of corrosion products formed less adherent and thus enables the anodes to do their work with maximum efficiency.

Sea water is an extremely corrosive medium, and no metallic coating is able, by itself, to afford sufficient protection from it. A coating weight of 2 oz. per sq. ft. of zinc may only last for four years. The use of zinc anodes in conjunction with metallic coatings has greatly increased the lives of the latter, and there are now many parts of ships that benefit from such dual protection. In the early days of their use, the importance of a good electrical contact between anode and protected surface was not fully appreciated. However, the practice of bolting anodes directly to the sides of ships has now been abandoned as unsatisfactory and instead straps of galvanised steel are cast into the anodes and these are then welded or bolted to the structure; in this way, much better contact is ensured.

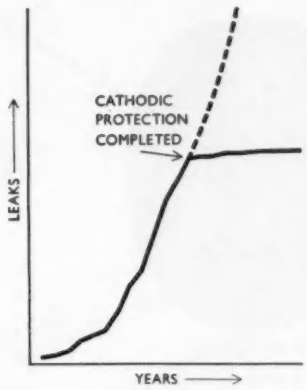
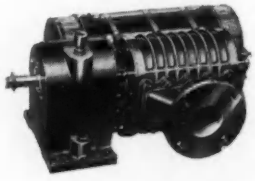


Fig. 2. Cathodic protection by zinc anodes.

There are many varied uses for zinc anodes, and in all of them cathodic protection ensures that maintenance worries will be reduced to a minimum. In sea water, it is complementary to metallic coatings which are inadequate alone: in earth, it avoids early corrosion failures and makes servicing unnecessary for long periods at a time. Although cathodic protection in several of its applications has been handicapped in the past by ignorance of the correct techniques, zinc anodes should find new uses now that research has shown the importance of high purity metal and of properly designed installations.



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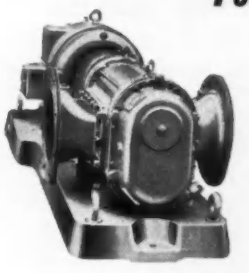

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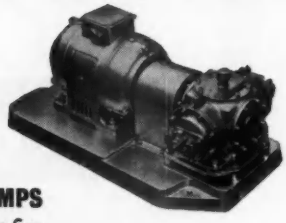

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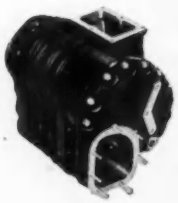

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APPLICATIONS are invited from suitably qualified persons for the following appointments in the Chief Engineer's Department at the Headquarters of the Board in Edinburgh:—

1. Assistant to Distributing Engineer:

The successful applicant will be required to assist the Board's Distributing Engineer in all matters relating to gas distribution, including the design of integration schemes and the development of distribution projects. A thorough knowledge of modern methods of high and low pressure distribution practice is essential and the person appointed must also be capable of carrying out technical advisory duties in connection with the planning, estimating and progressing of new work.

The salary will be within Grades A.P.T. 11/12 Provincial ' A ' (£895-£1,070 per annum) of the National Salary Scales, commencing at a figure commensurate with qualifications and experience.

2. Technical Assistant (Production):

Applicants should be corporate members of the Institute of Gas Engineers and should have experience in the installation, operation and control of all types of gasworks plant.

The successful candidate will be required to assist in all matters relating to gas production including the examination of operating results and the development of new projects.

The salary will be within Grades A.P.T. 10/11 (£820-£975 per annum) of the National Salary Scales commencing at a figure commensurate with qualifications and experience.

The posts are pensionable and the successful applicants will be required to pass a medical examination.

Applications stating age, and giving details of education, training, qualifications and experience, together with the names of two referees should be sent to the undersigned within 14 days of the appearance of this advertisement.

A. T. HERD,
Secretary.

26, Drumsheugh Gardens,
Edinburgh, 3.
July 17, 1957.

WEST MIDLANDS GAS BOARD

WOLVERHAMPTON & DISTRICT DIVISION
MAINS INSPECTOR—CENTRAL GROUP

APPLICATIONS are invited for a MAINS INSPEC-TOR, who will be responsible to the District Manager of the Central Group, for supervising main and service laying operations.

The salary for the post will be within Grade A.P.T. 6 (£640-£720 per annum) of the National Salary Scales.

The post is pensionable and the successful candidate may be required to pass a medical examination.

Applications, stating age, qualifications and experience, together with the names of two referees, should be sent to Mr. S. Jones, Divisional General Manager, West Midlands Gas Board, Kensington House, Bath Street, Dudley, to reach him not later than July 31, 1957.

J. SWAN,
Secretary to the Board.

(*Classified advertisements continued on page* 196)

APPOINTMENTS VACANT (ctd.)

WEST MIDLANDS GAS BOARD

WARWICKSHIRE DIVISION
SENIOR HOME SERVICE ADVISER,
COVENTRY DISTRICT

CANDIDATES for the above position should have had at least two years' training in Domestic Science, with an appropriate diploma. The applicant should be capable of working independently, of conducting cookery and laundry demonstrations using gas appliances and should also have had experience in Home Service work and controlling a small staff.

The salary will be within the range of Special Grade 6 (£531-£621 rising eventually to £670 p.a.) of the National Salary Scales. The post is pensionable and the successful candidate may be required to pass a medical examination.

Applications stating age, education, qualifications and experience, with the names of two referees, should be sent to Mr. A. Allen, Divisional General Manager, West Midlands Gas Board, Gas Offices, Gas Street, Coventry, to reach him not later than August 6, 1957.

J. SWAN,
Secretary to the Board.

WEST MIDLANDS GAS BOARD

WORCESTERSHIRE/HEREFORDSHIRE DIVISION
ASSISTANT ENGINEER AND MANAGER,
HEREFORD DISTRICT

APPLICATIONS are invited for the above post from qualified Gas Engineers who should be familiar with plant of modern design. The installation comprises a Water Gas Plant and Woodall-Duckham Vertical retorts, with a daily capacity of 2¼ million cu.ft.

The Salary will be within A.P.T. Grade 11 (£895-£1,020 p.a.) of the National Salary Scales for Gas Staffs.

The post is pensionable and the successful candidate may be required to pass a medical examination.

A modern house will be available on a service tenancy.

Applications, stating age, details of training, qualifications and experience, should be sent to K. E. Jones, Esq., Divisional General Manager, West Midlands Gas Board, Newtown Road, Worcester, to reach him not later than July 31, 1957.

J. SWAN,
Secretary to the Board.

WEST MIDLANDS GAS BOARD

WALSALL & DISTRICT DIVISION
NEW BUILDINGS INSPECTOR
WALSALL DISTRICT

APPLICATIONS are invited for the above position. The successful candidate will be required to meet Builders, Architects, and prospective tenants of new houses being erected in the Walsall District and part of the area covered by the Cannock Group of Undertakings. Applicants should be fully conversant with all types of modern gas appliances and be capable of preparing simple estimates for the installation of gas supplies.

The salary for the post will be within the range of A.P.T. Grade 6 (£640-£720 per annum) of the National Salary Scales.

The post is pensionable and the successful candidate may be required to pass a medical examination.

Applications, stating age and experience, together with the names of two referees, should be sent to F. Harvey, Esq., Divisional General Manager, West Midlands Gas Board, Tame Bridge, West Bromwich Road, Walsall, to reach him not later than July 31, 1957.

J. SWAN,
Secretary to the Board.

WEST MIDLANDS GAS BOARD

WALSALL & DISTRICT DIVISION
DEPUTY GROUP ENGINEER & MANAGER,
CANNOCK GROUP

APPLICATIONS are invited for the above appointment, the salary for which will be within the range of Scale B (£1,155 × £40—£1,315 p.a.) of the National Salaries Table for Senior Gas Officers.

The successful candidate will be primarily responsible to the Group Engineer and Manager for the supervision of engineering matters, but will also assist in the general administration of the Group.

The Group comprises approximately 31,000 consumers and covers the area of Lichfield, Tamworth, Cannock and Rugeley. There are manufacturing stations at the two latter districts, with capacities of 2.0 mill. and 0.4 mill. cu.ft. per day respectively.

Applicants should be qualified Gas Engineers and have experience in the bulk supply and distribution of gas in addition to production.

Applications, stating age, education, qualifications and experience, together with the names of two referees, should be sent to the Industrial Relations Officer, West Midlands Gas Board, 6, Augustus Road, Edgbaston, Birmingham, 15, to reach him not later than July 31, 1957.

J. SWAN,
Secretary to the Board.

NORTH EASTERN GAS BOARD

HULL GROUP
BRIDLINGTON DISTRICT
DISTRICT ENGINEER AND MANAGER

APPLICATIONS are invited for the above appointment, which will become vacant in September, 1957, at a salary within Group 'B' (£1,155-£1,315 per annum) of the National Salaries Table for Senior Gas Officers.

Candidates should be Corporate Members of the Institution of Gas Engineers and should have had good general experience of Gas Manufacture and Distribution, Sales and Administration.

The carbonising plant at Bridlington consists of Intermittent Vertical Chamber Ovens and the annual output is approximately 380 mill. cu.ft., of which 60 mill. are supplied in bulk to Driffield. The post will include responsibility for the Driffield area.

The successful candidate will be required to pass a medical examination and to join the Board's Staff Pension Scheme.

Applications giving details of age, experience and qualifications should reach the Group General Manager, North Eastern Gas Board, Hull Group, Bankside Works, Sculcoates, Hull, by August 7, 1957.

J. C. GARDNER,
Secretary.

NORTH WESTERN GAS BOARD

WIRRAL GROUP
PRODUCTION ENGINEERING ASSISTANT

APPLICATIONS are invited for the above pensionable post. The commencing salary will depend upon qualifications and experience and will be within Group A of the National Salaries Table, viz., £1,075-£1,195 p.a.

The person appointed will be responsible to the Group Production Engineer for matters concerned with the technical control of existing plant, and investigation and development work on any technical processes associated with gas production, for which purpose the resources of the Central Laboratory will be available to him.

The scope of the position is more fully described in a leaflet available to those who are interested and this, together with an application form, which must be returned not later than Wednesday, August 14, 1957, may be obtained from the General Manager, Wirral Group, North Western Gas Board, Hind Street, Birkenhead.

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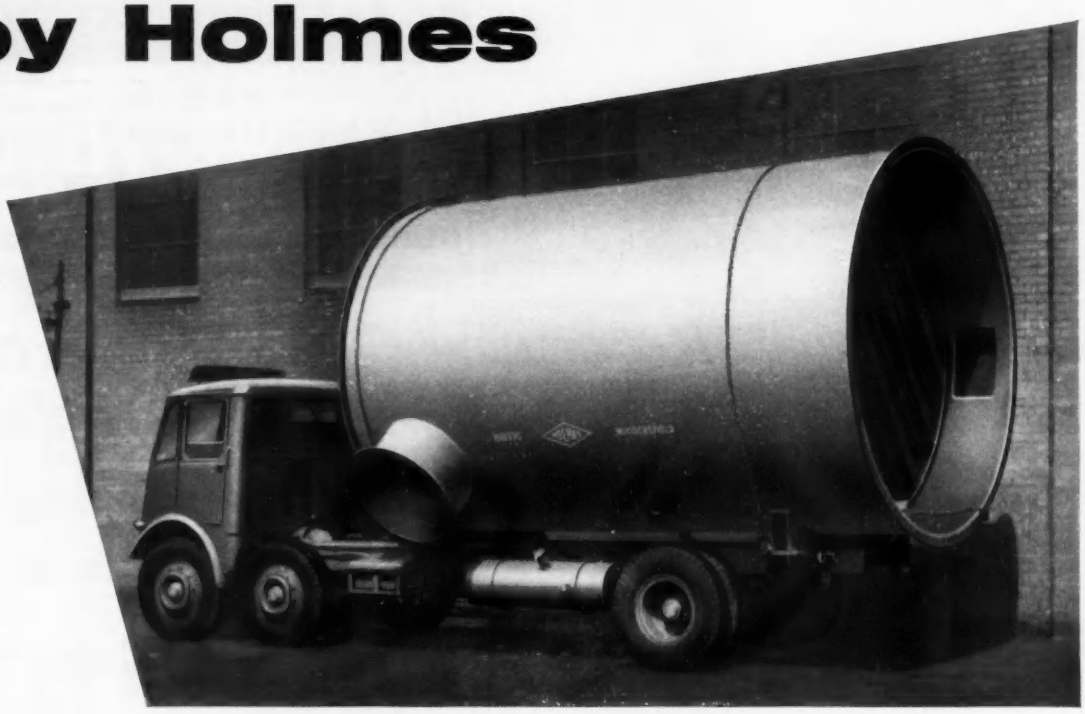

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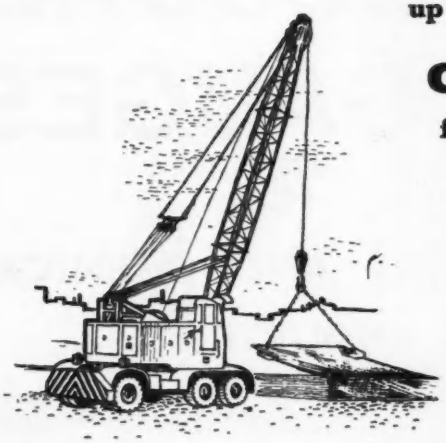

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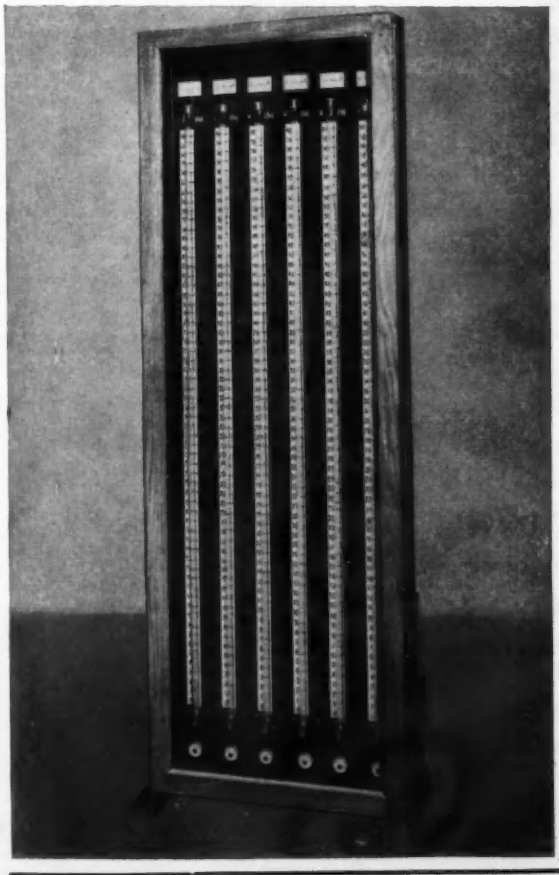

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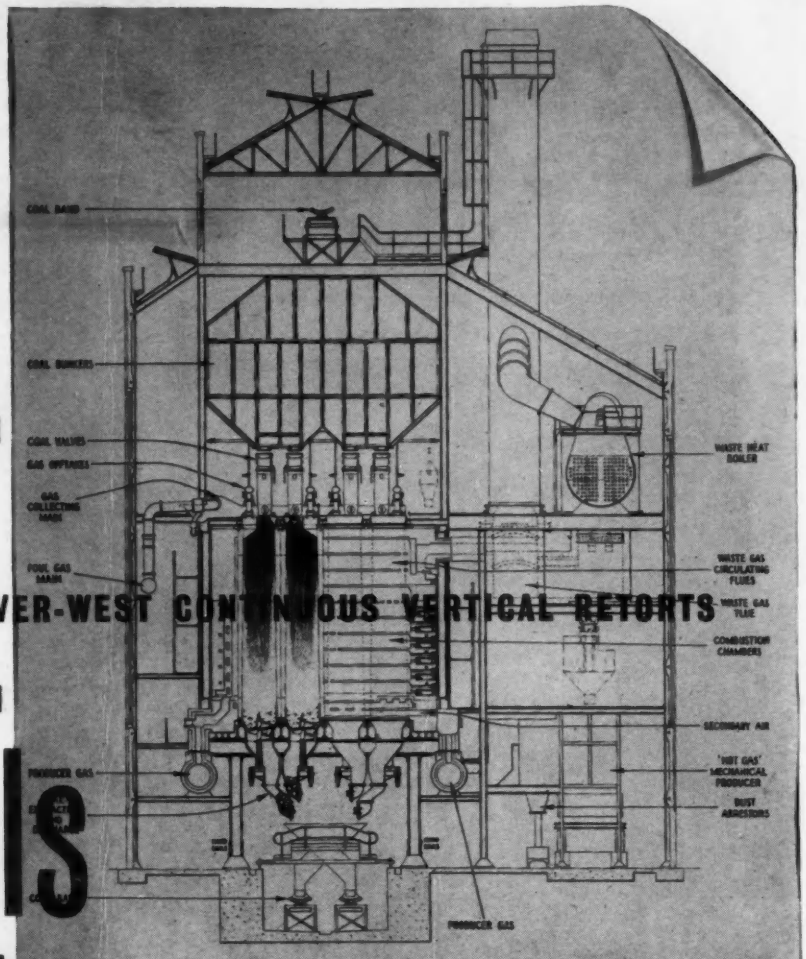

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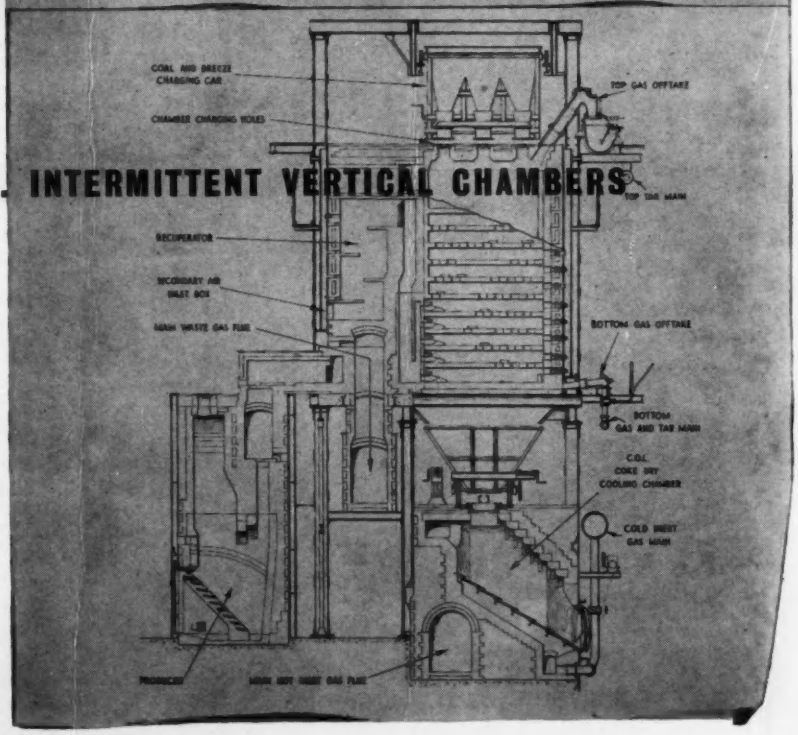

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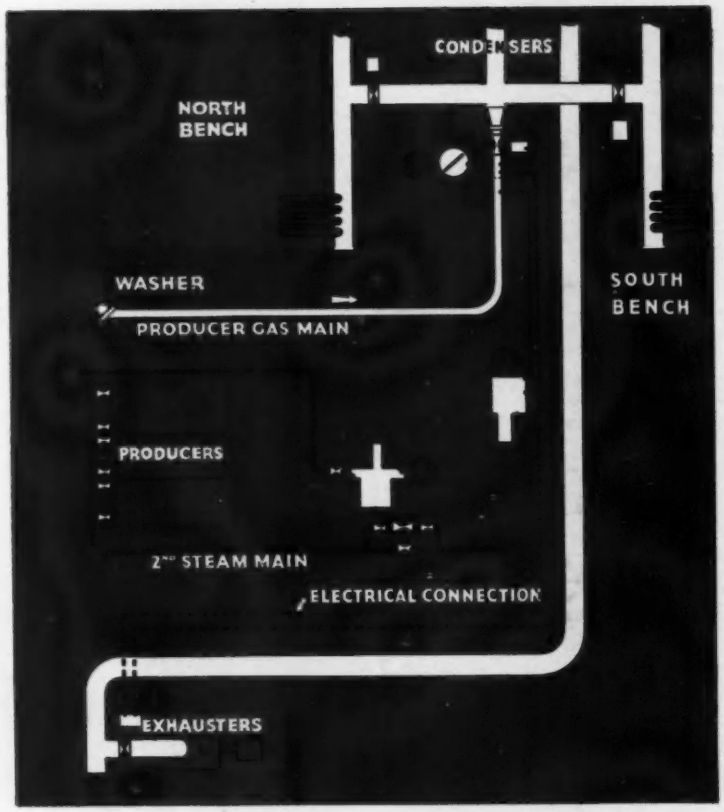

At the Ponders End Works, Tottenham Division, Eastern Gas Board, raw gas from two I.V.C. benches is diluted by approximately 50 B.Th.U., by washed producer gas. The diluent gas is introduced before the primary condensers via a motorised proportioning valve. The valve is operated remotely by push button controls about 400 feet away. Here the C.V. trend is observed on a nearby calorimeter connected at inlet to benzole plant.

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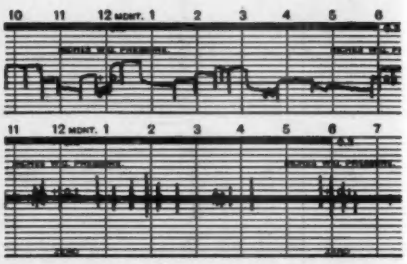

Diluent producers offtake pressure records. The lower chart shows the effect of automatic control of Venturi steam.

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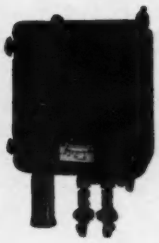

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